LYONS FALLS INITIAL CONSULTATION/AMENDMENT PACKAGE



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TABLE OF CONTENTS

Exhibit	Title	Page No.
Evinor		A 1
EXHIBII	A - PROJECT DESCRIPTION	A-1
A.1	General Project Description	A-1
	A.1.1 Project Overview	A-1
A.2	Existing and Proposed Features Characteristics	A-2
	A.2.1 Existing Features	A-2
	A.2.2 Proposed Features	A-4
A.3	Impoundment Characteristics	A-5
A.4	Transmission Facilities	A-6
A.5	Appurtenant Equipment	A-6
A.6	Lands of the United States	A-6
Exhibit	B - PROJECT OPERATIONS AND RESOURCE UTILIZATION	B-1
B.1	Existing Operations	B-1
	B.1.1 High Flow Periods	B-2
	B.1.2 Low and Mean Flow Periods	B-2
	B.1.3 Generation Records	B-2
B.2	Resource Utilization	B-2
	B.2.1 Method of Plant Operation and Annual Plant Factor	B-2
	B.2.2 Flows	B-3
B.3	Proposed Operation	B-3
	B.3.1 Proposed Minimum Flow Provisions	B-4
	B.3.2 Generation	B-4
Exhibit	C - CONSTRUCTION HISTORY AND PROPOSED SCHEDULE	C-1
C.1	Construction History	C-1
C.2	Proposed Construction Schedule	C-1
Exhibit	D - Statement of Costs and Financing	D-1
Exhibit	E - Environmental Report	E-1
E.1	Introduction	E-1
E.2	Affected Environment	E-2
	E.2.1 General Description of the Locale	E-2
	E.2.2 Report on Water Use and Quality	E-13
	E.2.3 Report on Fisheries Resources	E-34
	E.2.4 Report on Terrestrial Wildlife	E-57

TABLE OF CONTENTS

(Continued)

Exhibit

Page No.

E.2.5	Report on Botanical Resources	E-61
E.2.6	Report on Threatened and Endangered Species	E-65
E.2.7	Report on Recreation Resources	E-69
E.2.8	Report on Cultural and Historic Resources	E-79
E.2.9	Report on Land Management and Aesthetics	E-85
E.2.10) Relevant Comprehensive Plans	E-92
EXHIBIT F - GEI	NERAL DESIGN DRAWINGS	F-1
EXHIBIT G - PRO	DJECT BOUNDARY	G-1

APPENDICES

APPENDIX A - LYONS FALLS MILL FLOW DURATION CURVES APPENDIX B - IMPOUNDMENT SEDIMENT CHARACTERIZATION AND DEPTH APPENDIX C - MACROINVERTEBRATE DATA APPENDIX D - CONSULTATION CORRESPONDENCE

LYONS FALLS INITIAL CONSULTATION /AMENDMENT PACKAGE

LIST OF FIGURES

Figure	Title	Page No.
FIGURE A.4-1	SINGLE-LINE DIAGRAM	A-7
FIGURE E.2-1	LYONS FALLS MILL	E-3
FIGURE E.2-2	LOCATION OF THE BLACK RIVER WATERSHED AND LYONS FALLS MILL	E-4
FIGURE E.2-3	SOILS MAPPED IN THE VICINITY OF LYONS FALLS MILL	E-9
FIGURE E.2-4	DO, PH, CONDUCTIVITY, AND WATER TEMPERATURE MONITORING STATIONS ESTABLISHED AT LYONS FALLS MILL, LYONS FALLS, NEW YORK, AUGUST 23 & 24, 2006	E-19
FIGURE E.2-5	DISSOLVED OXYGEN BY DEPTH AND SAMPLING TIME IN THE UPPER IMPOUNDMENT, LYONS FALLS MILL, LYONS FALLS, NEW YORK, AUGUST 23 & 24, 2006	с Е-22
FIGURE E.2-6	DISSOLVED OXYGEN BY DEPTH AND SAMPLING TIME IN THE LOWER IMPOUNDMENT, LYONS FALLS MILL, LYONS FALLS, NEW YORK, AUGUST 23 & 24, 2006	Е-22
FIGURE E.2-7	DISSOLVED OXYGEN BY DEPTH AND SAMPLING TIME IN THE MIDDLE IMPOUNDMENT, LYONS FALLS MILL, LYONS FALLS, NEW YORK, AUGUST 23 & 24, 2006	E-23
FIGURE E.2-8	WATER TEMPERATURE BY DEPTH AND SAMPLING TIME IN THE UPPER IMPOUNDMENT, LYONS FALLS MILL, LYONS FALLS, NEW YORK, AUGUST 23 & 24, 2006	E-23
FIGURE E.2-9	WATER TEMPERATURE BY DEPTH AND SAMPLING TIME IN THE MIDDLE IMPOUNDMENT, LYONS FALLS MILL, LYONS FALLS, NEW YORK, AUGUST 23 & 24, 2006	E-24
FIGURE E.2-10	WATER TEMPERATURE BY DEPTH AND SAMPLING TIME IN THE LOWER IMPOUNDMENT, LYONS FALLS MILL, LYONS FALLS, NEW YORK, AUGUST 23 & 24, 2006	E-24
FIGURE E.2-11	SURFACE PH VALUES FOR ALL SITES, LYONS FALLS MILL, LYONS FALLS, NEW YORK, AUGUST 23 & 24, 2006	E-25

LIST OF FIGURES

(Continued)

Figure	Title	Page No.
FIGURE E.2-12	MACROINVERTEBRATE SAMPLING STATIONS AT LYONS FALLS MILL LYONS FALLS, NEW YORK, NOVEMBER 2006	E-27
FIGURE E.2-13	COMPARISON OF THE RELATIVE PERCENT COMPOSITION OF THE DOMINANT BENTHIC MACROINVERTEBRATE TAXA AT LYONS FALLS MILL, LYONS FALLS, NEW YORK, NOVEMBE 2006)F Г R E-29
FIGURE E.2-14	LOCATION OF SHORELINE ELECTROFISHING SURVEYS AT LYONS FALLS MILL, LYONS FALLS, NEW YORK, NOVEMBE 2006	R E-41
FIGURE E.2-15	LOCATION OF GILL NETS DURING BASELINE FISHERIES SURVEYS, LYONS FALLS MILL, NEW YORK, NOVEMBER 200)6E-42
FIGURE E.2-16	COMPARISON OF NIGHT VS. DAY ELECTROFISHING SURVE RESULTS IN THE LYONS FALLS MILL TAILRACE AREA, LYO FALLS, NEW YORK, NOVEMBER 2006	Y DNS E-45
FIGURE E.2-17	BLACK RIVER FLOW CONDITIONS DURING SAMPLING EFFORTS, LYONS FALLS, NEW YORK, NOVEMBER 2006 – BOONVILLE USGS GAGE, PRORATED TO LYONS FALLS. (CIRCLES INDICATE BEGINNING AND END OF SAMPLING EFFORTS)	E-47
FIGURE E.2-18	DISTRIBUTION AND CLASSIFICATION OF SUBSTRATES IN T TAILRACE OF LYONS FALLS MILL	ΉE E-50
FIGURE E.2-19	CHARACTERIZATION OF WATER VELOCITY IN THE TAILRA OF LYONS FALLS MILL, NOVEMBER 2006	ACE E-51
FIGURE E.2-20	CHARACTERIZATION OF WATER DEPTH IN THE TAILRACE LYONS FALLS MILL, NOVEMBER 2006	OF E-52
FIGURE E.2-21	NWI-MAPPED WETLANDS IN THE VICINITY OF LYONS FALI MILL	_S E-63
FIGURE E.2-22	RECREATIONAL SITES ASSOCIATED WITH LYONS FALLS MILL, VILLAGE OF LYONS FALLS, NEW YORK	E-72

LYONS FALLS INITIAL CONSULTATION /AMENDMENT PACKAGE

LIST OF TABLES

Table	Title	Page No.
TABLE A.2-1	EXISTING TURBINE/GENERATING UNIT CHARACTERISTIC	S A-3
TABLE A.2-2	PROPOSED TURBINE/GENERATING UNIT CHARACTERISTIC	CS A-5
TABLE A.3-1	IMPOUNDMENT CHARACTERISTICS	
TABLE B.1-1	AVERAGE MONTHLY AND ANNUAL DATA*	B-1
TABLE B.3-1	EXPECTED AVERAGE MONTHLY AND ANNUAL GENERATI	ION B-4
TABLE C_{2-1}	PROPOSED CONSTRUCTION SCHEDULE	C-2
TABLE E.2-1	DESCRIPTION OF SAMPLING SITES, DATES, AND TIMES OF WATER QUALITY MONITORING AT LYONS FALLS MILL, LYONS FALLS, NEW YORK, AUGUST 23 & 24, 2006	E-20
TABLE E.2-2	SUMMARY OF MEAN DISSOLVED OXYGEN, PH, CONDUCTIVITY, AND WATER TEMPERATURE SAMPLING RESULTS AT LYONS FALLS MILL, LYONS FALLS, NEW YOI AUGUST 23 & 24, 2006	RK, E-21
TABLE E.2-3	SUMMARY OF MEAN BMI COMMUNITY METRICS AT LYON FALLS MILL, LYONS FALLS, NEW YORK, NOVEMBER 2006	NS E-30
TABLE E.2-4	NUMBER AND RELATIVE PERCENT OF FISH CAPTURED IN BLACK RIVER BELOW LYONS FALLS MILL (BETWEEN LYC FALLS AND CARTHAGE) AND ABOVE LYONS FALLS MILL (BETWEEN LYONS FALLS AND NORTH LAKE) (SOURCE: NYSDEC BUREAU OF FISHERIES 1993)	THE DNS E-36
TABLE E.2-5	FISH CAPTURED DURING DAYTIME AND NIGHTTIME BOA ELECTROFISHING SURVEYS IN THE LYONS FALLS MILL TAILRACE, NOVEMBER 2006, LYONS FALLS, NEW YORK	Г Е-43
TABLE E.2-6	FISH CAPTURED DURING DAYTIME BOAT ELECTROFISHIN SURVEY IN THE LYONS FALLS MILL IMPOUNDMENT, NOVEMBER 2006, LYONS FALLS, NEW YORK	JG E-44
TABLE E.2-7	SUMMARY OF DEPTH AND VELOCITY MEASUREMENTS TAKEN IN THE LYONS FALLS MILL TAILRACE, NOVEMBEI 2006	R E-53

LIST OF TABLES

(Continued)

TABLE E-2.8	NWI-MAPPED WETLANDS IN THE VICINITY OF LYONS FALLS MILL	.E-63
TABLE E.2-9	FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES THAT MAY OCCUR WITHIN THE VICINITY OF LYONS FALLS MILL	.E-66
TABLE E.2-10	ESTIMATED 2007 RECREATION USE BY DAY TYPE AT LYONS FALLS MILL	.E-75
TABLE E.2-11	ESTIMATED 2007 DAYTIME, NIGHTTIME AND PEAK WEEKEND AVERAGES AT LYONS FALLS MILL	.E-76
TABLE E.2-12	PREVIOUSLY REPORTED ARCHAEOLOGICAL AND HISTORIC RESOURCES WITHIN ONE MILE OF LYONS FALLS MILL	.E-83
TABLE E.2-13	LEWIS COUNTY LAND USE	.E-86

Exhibit A - Project Description

A.1 General Project Description

A.1.1 Project Overview

Northbrook Lyons Falls, LLC (NBLF), an affiliate of Kruger Energy, Inc. (Kruger) is the licensee for the Lyons Falls Project (FERC No. 2548) (Project). The Project was initially constructed in 1920 and is located along the Moose and Black Rivers in Lewis County, New York. The developments include (from downstream to upstream) Lyons Falls Mill, Gouldtown, and Kosterville. The Project has a total installed capacity of 8.63 megawatts (MW). The Project operates under a license issued by the Federal Energy Regulatory Commission (FERC or Commission) on May 6, 1986, and expires on May 31, 2026. NBLF is proposing to redevelop the Lyons Falls Mill Development (Lyons Falls Mill or the Development) to increase the facility's efficiency and overall energy output. Redevelopment of Lyons Falls Mill will increase the capacity of this facility from 5.8 MW to 11.2 MW. The proposed redevelopment requires an amendment to the Project's existing FERC license.

Lyons Falls Mill is located in the Village of Lyons Falls in the Town of West Turin, Lewis County, New York, approximately 42 miles north of Utica and 40 miles south of Watertown, New York. The existing dam, powerhouses, and impoundment are located within and adjacent to a former Georgia-Pacific paper mill on river left (looking downstream) at the confluence of the Black and Moose Rivers, approximately 82 river miles (RM) upstream of Lake Ontario. The upstream drainage at Lyons Falls Mill is approximately 879 square miles.

Existing generating equipment at Lyons Falls Mill is housed within two powerhouses located on river left within the footprint of the former paper mill. The Development includes five turbines ranging in size from 900 to 1,200 kilowatts (kW). The main powerhouse contains four horizontal turbines and a second powerhouse contains a single vertical turbine. Lyons Falls Mill impoundment extends upstream into the lowermost reach of the Moose River. The Project's two other developments (Gouldtown and Kosterville) are located on the Moose River at RM 1.0 and 1.3, respectively.

In 2006, an Initial Consultation Document (ICD) proposing the addition of a new 9 MW powerhouse to Lyons Falls Mill was prepared and distributed to interested parties. The 2006 proposal included the development of the new powerhouse on river right, across from the former paper mill and the existing facility's powerhouses. Based primarily on the proposed location of the new powerhouse, there was considerable opposition to this proposal. Therefore, NBLF did not pursue redevelopment of Lyons Falls Mill as described in the 2006 proposal.

Recent activity relating to the former paper mill has created an opportunity for NBLF to revisit upgrading Lyons Falls Mill, increasing both power production and efficiency. The ongoing demolition of the adjacent paper mill will allow all redevelopment activities associated with the hydropower facility to occur within the footprint of the former paper mill site on the river left shoreline, as compared to the river right as was proposed in 2006. Upon approval of the redevelopment, the existing primary powerhouse will be demolished and the single-unit powerhouse will be mothballed; thus, all five existing generating units will be decommissioned. A new powerhouse will then be constructed to house two new vertical generating units with a total nameplate capacity of 11.2 MW. The proposed redevelopment is limited to the Project's Lyons Falls Mill and will not affect the Gouldtown or Kosterville Developments.

A.2 Existing and Proposed Features Characteristics

The redeveloped Lyons Falls Mill will utilize the existing dam and spillway and will consist of a replacement of the existing intake and trashrack structures, as well as the construction of a new powerhouse and the installation of the two new generating units and a new generator tie line. The physical composition and dimensions of existing and proposed features are described below.

A.2.1 Existing Features

The existing Lyons Falls Mill includes a 431.5-foot-long, 10-foot-high, "L-shaped" concrete gravity dam with a 362-foot-long spillway section and a 69.5-foot-long concrete gate structure adjoining the west (river left) end of the dam. The concrete gate structure contains two 6-foot-

high, 25-foot-wide flood control gates and one 6-foot-high, 8-foot-wide sluice gate. The spillway is equipped with 26-inch-high wooden flashboards that maintain a 130-acre impoundment with a gross storage volume of 730 acre-feet at an elevation of 806.5 feet above mean sea level (msl) (top of flashboards). The normal tailwater elevation of 734.4 feet msl at Lyons Falls Mill results in a gross head of 68.1 feet.

The intake structure is located adjacent to the river left dam abutment and is equipped with trashracks measuring 18 feet high and 89 feet wide. The trashracks have a clear bar spacing of 1 and 7/8 inches. The intake area also includes a 3.75-foot-wide by 6-foot-high manually operated bottom-opening debris gate. All existing equipment and structures at Lyons Falls Mill are located on river left within the footprint of the former paper mill.

The intake structure feeds three penstocks that lead to two powerhouses. Each penstock has an individual, manually operated intake gate. Existing generating equipment at Lyons Falls Mill is housed within two powerhouses located on river left. The Development includes five turbines ranging in size from 900 to 1,200 kW. The main powerhouse is fed by 12-foot and 6-foot-diameter penstocks and contains four horizontal turbines (units 6, 7, 8, and 9). A second powerhouse is fed by an 8-foot-diameter penstock and contains a single vertical turbine (unit 1). The total authorized capacity of Lyons Falls Mill is 5.8 MW. Relevant information regarding the existing turbine/generating units at Lyons Falls is presented in Table A.2-1, below.

	Unit 1	Unit 6	Unit 7	Unit 8	Unit 9
Unit Type (propeller)	Vertical	Horizontal	Horizontal	Horizontal	Horizontal
Rated Flow (cfs)	250	250	250	170	70
Rated Head (feet)	67	69	69	69	64
Generator Power Factor	0.8	0.8	0.8	0.8	0.8
Power (kVA)	1,500	1,500	1,500	1,608	1,125
Generating Capacity (kW)	1,040	1,200	1,200	1,286	900

 TABLE A.2-1

 EXISTING TURBINE/GENERATING UNIT CHARACTERISTICS

A.2.2 Proposed Features

As a result of the plan to continue the demolishing of the former paper mill, space is being made available to allow for the proposed redevelopment of the existing hydropower facility. In support of the redevelopment, NBLF proposes to demolish the main powerhouse and mothball the single-unit powerhouse. The decommissioned powerhouses will then be replaced by a single powerhouse containing two generating units. In contrast to the 2006 proposal where a new powerhouse was proposed on the east side of the river (river right), all proposed redevelopment activities will occur within the footprint of the paper mill on west side of the river (river left).

The proposed Lyons Falls Mill redevelopment would continue to use the existing "L-shaped" concrete gravity dam, including the 362-foot-long spillway section, 69.5-foot-long concrete structure adjoining the river left end of the dam, and the existing 26-inch-high flashboards. Under the proposed plan, there would be no modifications to the dam and, thus, no changes to the size or gross storage capacity of the existing impoundment as a result of redevelopment.

In support of the new powerhouse, NBLF would construct a new combined intake and trashrack structure adjacent to the river left dam abutment. The concrete intake/trashrack structure will be located slightly landward of the existing intake structure and will measure 60 feet long, 45 feet wide, and 40 feet high to the top of the intake gate operating deck. The intake structure will be equipped with two angled trashracks, each measuring 24.5 feet high and 25 feet wide. In an attempt to limit the effect of ice build up on the facility's trashracks, the trashracks will have a clear-bar spacing of three inches and will be equipped with seasonal one-inch trashrack overlays. A trash rake will be installed to remove debris from the trashracks.

Two 11.5-foot-diamter, 75-foot-long steel penstocks will convey water from the new intake structure to a new concrete and masonry powerhouse located along river left, largely in the footprint of the existing powerhouse. The penstocks will be equipped with automated headgates.

The powerhouse will measure 63 feet wide, 60 feet long and 105.5 feet tall from the bedrock interface to the top of the roof and will house two vertical "Saxo" Kaplan turbines. Each turbine

will have a runner diameter of 2.25 meters and a rated flow of 1,236 cubic feet per second (cfs). The Saxo units will be directly connected to two new generators. Relevant information regarding the proposed new turbine/generating units is presented in Table A.2-2.

 TABLE A.2-2

 PROPOSED TURBINE/GENERATING UNIT CHARACTERISTICS

TURBINES			
Unit Type	Vertical "Saxo" Kaplan		
Number of Units	2		
Runner Diameter	2.25 meters		
Rated Head	64 feet		
Rated Flow	1,236 cfs each		
Rated Horsepower (or kW)	5,600 kW		
Min. Hydraulic Capacity	237 cfs each		
Max. Hydraulic Capacity	1,342 cfs each		
Project Min. Hydraulic Cap.	237 cfs		
Project Max. Hydraulic Cap.	2,684 cfs		
GENERATORS			
Number of Units	2		
Voltage	4.16 kV		
Nameplate Capacity (kVA)	6,251 kVA		
Total Installed Capacity	11.2 MW		
Average Annual Generation	66,331 MWh		
Monthly Average Generation	5,527 MWh		
Power Factor	0.9		

A.3 Impoundment Characteristics

NBLF proposes to use the water power potential of the existing dam and impoundment. No changes to the impoundment are proposed as a result of redevelopment of Lyons Falls Mill. Relevant impoundment characteristics are presented in Table A.3-1.

IMPOUNDMENT CHARACTERISTICS			
Elevations, Surface Areas, and Volumes are for both Existing and Proposed			
Elevation (top of flashboards)	806.5 feet msl		
Surface Area	130 acres		
Volume	730 acre-feet		

TABLE A.3-1IMPOUNDMENT CHARACTERISTICS

A.4 Transmission Facilities

Generator leads rated at 5 kV will extend from the new powerhouse to a new 15 MVA generator step-up (GSU) transformer to be located near the new intake structure. The GSU will step-up generation voltage from 4.16 kV to the distribution voltage of 23 kV. A new 23 kV aerial transmission line will extend slightly under 2,640 feet from the GSU transformer to the existing circuit breaker for Lyons Falls Mill. From this point to the utility point of interconnection at the existing National Grid transformer located in the Franklin Street Substation, the existing overhead conductors will remain. A single-line diagram is presented as Figure A.4-1

A.5 Appurtenant Equipment

The proposed powerhouse structure will contain all new appurtenant equipment and ancillary systems including medium-voltage switchgear, controls, excitation, governors, power units for gates and turbines, batteries, and station service electrical systems.

A.6 Lands of the United States

There are no lands of the United States associated with Lyons Falls Mill.



FIGURE A.4-1 SINGLE-LINE DIAGRAM

Exhibit B - Project Operations and Resource Utilization

B.1 Existing Operations

The existing FERC license requires that NBLF operate Lyons Falls Mill in a run-of-river mode. Given the limited size of the impoundment and the age of the units, some reservoir fluctuation does occur under varying flow conditions. Spillway elevation is generally maintained at 806.5 feet, which is the result of maintaining the 26-inch flashboards on top of the spillway crest, which has an elevation of 804.3 feet (crest of spillway). Currently, all river flows of 70 cfs (minimum operating point for unit 9) to 1,170 cfs (maximum hydraulic capacity of all 5 generating units) are passed through the existing units on the west side of the river. Average monthly and annual flow and generation data are presented in Table B.1-1.

Month	Average Flow (cfs)	Existing Average Generation (MWh)
January	1,944	2,664
February	1,707	2,190
March	2,833	2,627
April	4,786	2,874
May	2,403	2,732
June	1,609	2,465
July	1,144	2,098
August	998	1,785
September	1,197	1,959
October	2,115	2,786
November	2,438	2,771
December	2,301	2,788
Annual	2,123	29,486

TABLE B.1-1AVERAGE MONTHLY AND ANNUAL DATA*

*Flow data is provided for a period of record 1980 - 2014. Generation data is provided for a period of record (1970 – 2013, except 1979, 1981 – 1985, 2001 – 2003).

B.1.1 High Flow Periods

During periods of high flow, when inflow equals or exceeds the hydraulic capacity, Lyons Falls Mill is operated at full gate (full hydraulic capacity of the five turbines). Flows in excess of the hydraulic capacity are passed over the Development's spillway or through the Development's sluice gate.

B.1.2 Low and Mean Flow Periods

When sufficient quantities of water are not available to permit the continuous operation of the Development at full capacity, facility operation is scheduled to meet the demands of the local electric grid to the extent possible. The Development is operated such that current license article requirements are complied with during low or mean flow periods.

B.1.3 Generation Records

Lyons Falls Mill attempts to generate for the entire year, but at times has seasonal interruptions due to frazil ice accumulations on the trashracks and in the penstocks. Table B.1-1 above displays monthly generation records detailing months of highest and lowest electricity production.

B.2 Resource Utilization

B.2.1 Method of Plant Operation and Annual Plant Factor

Based on the generation from years 1980 to 2013 (except for years 1979, 1981 - 1985, 2001 - 2003) the power plant operation at Lyons Falls Mill is semi-automatic and has an annual plant factor of 64.7 percent.

B.2.2 Flows

Flow data for Lyons Falls Mill was developed by prorating historical river data from the Black River United States Geological Survey (USGS) Gage 04252500 from a period of record of 1980 to 2014. The flow was prorated by a factor of approximately 2.5, which was obtained by prorating the Black River data by the ratio of the Moose River drainage area to the Black River drainage area at the USGS gages and then prorating the data to Lyons Falls Mill. Table B.1-1 shows the average flows per month and the generation capacity associated with each flow for the period of record. Annual and monthly flow duration curves are presented in Appendix A to this report.

B.3 Proposed Operation

The proposed facilities would continue to be operated automatically in a run-of-river mode and in accordance with the high- and low-flow operations described above. The licensee would act to minimize impoundment fluctuation levels by maintaining discharges so that flow in the Black River, as measured immediately downstream from the tailrace, matches within reason inflows to the impoundment. The facility's tailrace discharge will continue to backwater up to the bedrock falls upon which the facility's spillway is situated.

Generation at Lyons Falls Mill would result entirely from the two new units. These units would operate independently at flows ranging from 237 to 2,684 cfs, which would account for approximately 74 percent of the annual flow regime. The existing units in the main powerhouse would be removed and the single unit in the secondary powerhouse would be mothballed. None of the five existing generators would be in operation in the future.

Differing from the proposal in 2006, operations would not be changed to river right or the east side of the river. Instead, operations would remain on river left with all redevelopment and operations occurring within the footprint of the existing paper mill.

B.3.1 Proposed Minimum Flow Provisions

NBLF proposes to release seasonal minimum flows totaling 70 cfs downstream from Lyons Falls Dam. Of the 70 cfs, a minimum of 45 cfs would be released annually from March 15 through November 30 to provide a fish movement continuity flow to facilitate the downstream movement of fish. A minimum flow of 25 cfs would also be released annually during the recreation season (May 1 through October 31) to provide a continuous flow over a portion of Lyons Falls for aesthetic purpose. NBLF will consult with resource agencies and other stakeholders to define the appropriate location(s) and mechanism(s) for the seasonal minimum flow releases.

B.3.2 Generation

Table B.3-1 presents average anticipated monthly and annual generation at Lyons Falls Mill.

Month Expected Average Generation (MWh)		
January	5,138	
February	4,586	
March	6,576	
April	7,965	
May	6,442	
June	4,638	
July	3,459	
August	3,052	
September	3,357	
October	5,610	
November	6,570	
December	6,099	
Annual	63,492	

TABLE B.3-1 EXPECTED AVERAGE MONTHLY AND ANNUAL GENERATION

Exhibit C - Construction History and Proposed Schedule

C.1 Construction History

Lyons Falls Mill is an existing dam and powerhouse facility owned by NBLF and operated by Kruger. Beginning in 1893, the Gould Paper Company built a timber crib dam and operated the dam until replacement in 1922 with the current concrete dam. Over the next few decades, the existing hydroelectric facilities were added to the mill complex. Lyons Falls Mill originally powered the Lyons Falls Pulp and Paper Mill until its closure in 2001. At this time, portions of the pulp and paper mill are being demolished under the auspices of the North Country Regional Economic Development Council and the Lewis County Development Corporation. The intent is to adaptively reuse the site to generate local economic growth adjacent to the proposed upgrades to Lyons Falls Mill.

C.2 Proposed Construction Schedule

The preliminary construction schedule forecasts a nineteen (19) month duration from the start of construction through final commissioning of Lyons Falls Mill. Within this 19-month duration, construction activities would include construction of a new intake, penstock, powerhouse, and installation of new trashracks. Construction would also require demolition of the main powerhouse, retiring the one-unit powerhouse, and removal of the existing penstocks.

The proposed construction schedule is presented in Table C.2-1 below and relies on the assumption of two key dates. The first is the proposed filing of the application for an amendment of license on April 15, 2015. The second is the Commission's anticipated order amending the Project's existing license on October 2, 2015. Once the order amending the license is issued, NBLF will promptly prepare for the commencement of construction. As presented in the schedule, the proposed construction schedule anticipates NBLF making the commitment to obtain the major pieces of equipment prior to the anticipated receipt of an

amended license. Such a schedule involves significant risk to NBLF to ensure that its license amendment application is complete and reflects the requirements of the major stakeholders.

	Item or Milestone	Start	Finish
1	Pre-Construction Planning, Engineering, and Final Design	5/1/2015	9/1/2016
2	Finalize Engineering Designs and Construction Specifications	5/1/2015	4/21/2016
3	Major Equipment Procurement, and Manufacture and Delivery (turbine/generator/electrical)	5/29/2015	9/1/2016
4	Finalization of Commercial Attributes (financing, PPA, interconnect agreement, access/other agreements)	5/1/2016	11/1/2016
5	Construction Contract Bid/Award	4/21/2016	6/30/2016
6	Submittal of Final Plans and Specifications to FERC (at least 60 days before start of construction)	4/4/2016	4/29/2016
7	Secure All Final FERC/NYSDEC/Other Approvals	6/20/2016	6/27/2016
8	Initial Site Work (security fencing, access roads, initial demolition, silt fencing)	7/1/2016	9/15/2016
9	Contractor Preparation (Site, Blasting and Drilling, Design, Security, Health and Safety, and Environmental Planning)	7/8/2016	8/18/2016
10	Procurement of Equipment Materials	7/29/2016	3/9/2017
11	On-Site Construction (cofferdam/excavation, blasting, water conveyance structures, concrete structures, equipment installation, balance of plant, transmission/substation)	8/26/2016	4/6/2018
12	Cofferdam Construction	8/26/2016	11/10/2016
13	Demolition and Excavation	11/2/2016	2/9/2017
14	Intake Construction	1/27/2017	11/10/2017
15	Power station Construction	1/11/2017	12/15/2017
16	Mechanical and Electrical Construction	1/25/2017	3/2/2018
17	Final Site Work (Grading, Paving, Guardrails, Demobilize)	1/8/2018	4/6/2018
18	Commissioning	3/5/2018	4/6/2018

TABLE C.2-1PROPOSED CONSTRUCTION SCHEDULE

Exhibit D - Statement of Costs and Financing

NBLF is developing cost estimates for construction and operation in conjunction with the ongoing engineering design process and stakeholder consultation. NBLF will continue to develop these estimates and will present the information required for Exhibit D – Statement of Costs and Financing in the final application.

E.1 Introduction

As described in Exhibit A, NBLF is proposing to redevelop Lyons Falls Mill, one of three existing developments that comprise the Lyons Falls Project. The Project was initially constructed in 1920 and is located along the Moose and Black Rivers in Lewis County, New York. The developments include (from downstream to upstream) Lyons Falls Mill, Gouldtown, and Kosterville. The Project has a total installed capacity of 8.63 MW.

The proposed redevelopment of Lyons Falls Mill would increase the facility's efficiency and energy output. Lyons Falls Mill is currently equipped with five turbine/generator units with a combined authorized capacity of 5.8 MW. The redevelopment would include decommissioning of the five existing generating units and the construction of a new powerhouse with two new vertical generating units. Redevelopment of Lyons Falls Mill will increase the total capacity at the facility from 5.8 to 11.2 MW. Specific details pertaining to existing and proposed facilities at Lyons Falls Mill are described in detail in Exhibit A.

Exhibit E contains relevant information regarding environmental resources associated with Lyons Falls Mill, commensurate with the scope of the proposed amendment. The geographic scope of this Exhibit E is the immediate construction footprint and the general area of Lyons Falls Mill where construction or operation of the new facilities may potentially impact resources outside of the immediate construction area.

For each resource area described in Exhibit E, NBLF has summarized existing information relevant to the proposed amendment. Where applicable, Exhibit E also summarizes relevant results of studies and information gathering activities previously conducted by NBLF in support of the proposed upgrades to Lyons Falls Mill in 2006. As described in Exhibit A, the 2006 proposal included the addition of a new, 9 MW powerhouse to Lyons Falls Mill on river right, across from the former paper mill and the existing facility's powerhouses. Although NBLF did not pursue development of Lyons Falls Mill at that time, the studies conducted in 2006 and 2007

provide relevant information regarding existing environmental conditions within the vicinity of Lyons Falls Mill.

NBLF notes that the current proposal for redevelopment of Lyons Falls Mill will allow all redevelopment activities to occur within the footprint of the former paper mill site on the river left shoreline, as compared to the river right as was proposed in 2006. The proposed redevelopment is limited to Lyons Falls Mill; NBLF is not proposing any modifications to the Gouldtown or Kosterville Developments.

E.2 Affected Environment

E.2.1 General Description of the Locale

Lyons Falls Mill is located in the Village of Lyons Falls in the Town of West Turin, Lewis County, New York, approximately 42 miles north of Utica and 40 miles south of Watertown, New York. The existing dam, powerhouses, and impoundment are located at the confluence of the Black and Moose Rivers, approximately 82 RM upstream of Lake Ontario (Figure E.2-1). Lyons Falls Mill impoundment extends upstream into the lowermost reach of the Moose River. The Project's two other developments (Gouldtown and Kosterville) are located on the Moose River at RM 1.0 and 1.3, respectively.

The Black River Valley is situated between the Adirondack Mountains and the Tug Hill Plateau. From its headwaters on the west slope of the Adirondacks, the Black River flows southwest approximately 14 RM into Kayuta Lake before turning north and flowing approximately 73 RM to the Town of Deferiet. From Deferiet, the Black River flows approximately 25 RM west where it empties into Black River Bay at the northeast end of Lake Ontario, just west of Watertown (Figure E.2-2). The total drainage area for the Black River is approximately 1,920 square miles (NYSDEC 2007a). Major tributaries of the Black River include the Moose River, Independence River, Beaver River, Deer River, and Otter Creek (NYSDEC 2007a).

FIGURE E.2-1 LYONS FALLS MILL







The Black River is divided into three natural reaches: a steep mountainous reach upstream of Lyons Falls Mill, a flat low-gradient reach between the villages of Lyons Falls and Carthage known as the "Black River Flats," and a high-gradient stretch below Carthage extending to Lake Ontario (Lowie et al. 1994). The upper watershed is characterized by numerous lakes and ponds that feed the fast-flowing headwaters of the Black River. The middle watershed is fed by small streams emerging from the Tug Hill Plateau region and major tributaries flowing west out of the Adirondacks. Further downstream, the Black River is fed primarily by drainage from the marshy lowlands of Lake Ontario (NYSDEC 2007a).

The Moose River has three major branches (North, Middle, and South), which originate as highgradient streams on the west slope of the Adirondacks. The confluence of the North Fork and the Middle Fork is near the hamlet of Old Forge, New York. The confluence of the South Fork is near McKeever, New York approximately 20 river miles upstream of the Village of Lyons Falls. The Moose River, especially in the middle and upper reaches, is a shallow, high-velocity, and high-gradient river system with numerous sections of rapids, cascades, and boulder-filled pocket water. Between the Town of Lyonsdale and the Village of Lyons Falls, the Moose River becomes low gradient, descending approximately 200 feet in three miles and is interspersed by only a few intermittent falls. The Moose River empties into the Black River in the impoundment of Lyons Falls Mill where it is low-gradient flatwater.

The consistent year-round flows and large overall drop in elevation have made the Black River and Moose River attractive for hydroelectric power development (Lowie et al. 1994). Reportedly, the first dam in the watershed was constructed at Beebe Island near Watertown in 1802 for development of a saw and grist (grain) production (Lowie et al. 1994). Currently, there are 39 hydropower developments within the Black River Basin, 21 of which are on the mainstem of the Black River (FERC 1995). At Lyons Falls Mill, the original timber crib dam was constructed in the late 1800s (Lowie et al. 1994).

Climate

Lyons Falls is characterized by cold snowy winters and moderately warm summers. Mean maximum daily temperature is approximately 78°F. Mean minimum daily temperature is approximately 8°F. Mean annual precipitation is approximately 42 inches. The wettest month of the year is typically November when precipitation amounts are often greater than seven inches. The driest month is typically February when average monthly precipitation is approximately 2.5 inches. Snowfall accumulation in the region is heavily influenced by lake-effect snow and cold air masses moving in an easterly direction over Lake Ontario. Annual snowfall in the area can be as high as 300 inches, reportedly the highest snowfall amount east of the Rocky Mountains (Dyballa et al. 1981). The Black River Drainage Basin receives the highest amount of precipitation annually of all the watersheds in New York (Lowie et al. 1994).

Topography

The Black River Basin is an extension of the Lake Ontario lowlands, a relatively low and flat topographic depression that sits atop layers of Cambrian and Ordovician sedimentary rock. The Black River Valley separates the two predominant geologic features in the area, the Tug Hill Plateau to the west and the Adirondack Mountains to the east. Contemporary topographic features in the Black River Valley are the product of intense glacial activity that occurred in New York during the advance and retreat of the Wisconsinan ice sheet approximately 18,000 years ago. Landscape features including gorges, troughs, moraines, kettle ponds, and eskers are the result of advancing and retreating ice and subsequent fluvial processes.

Geology

Geologic formations around Lyons Falls Mill are primarily represented by landforms associated with the Adirondack Mountains – New York State's oldest, highest, and most rugged geologic feature – and the Tug Hill Plateau, a small topographic extension of the Allegheny Plateau.

Due east of Lyons Falls Mill, the Adirondack Upland is a roughly circular dome-like mountainous region approximately 200 kilometers in diameter. The Adirondacks are part of the larger Greenville Province, a long north-south belt of metamorphic rock running from Labrador to Mexico along the western margin of the Appalachian Mountains. Although the Adirondacks themselves are relatively new geologically, they are composed of very old rock strata that consist primarily of complex and deformed ancient gneisses (metamorphic granite). Some of these rock formations may potentially be upwards of 1.5 billion years of age and subsequently are considered Precambrian basement rock strata. Contemporary landscape features of the Adirondacks are the results of long-term erosive, glacial, and geologic uplift processes. The most tectonically active segment of the Adirondacks, where earthquakes occasionally occur and fault lines are most prominent, is centered around the Blue Mountain Lake region, approximately 45 miles to the northeast of the low-lying Black River Valley and Lyons Falls Mill.

The Tug Hill Plateau, due west of Lyons Falls Mill, is a small extension (approximately 20 miles) of the Allegheny Plateau, which is part of the Appalachian Uplift Province (Dyballa et al. 1981; Van Diver 1992). The Tug Hill Plateau begins approximately 10 to 15 miles south of Lake Ontario, rising gradually in a southerly direction to a maximum elevation of 2,300 feet. Its underlying geologic features consist primarily of layered Paleozoic sedimentary rock (e.g., sandstone and slate) that is tilted to the west because of recent uplift associated with the neighboring Adirondacks. Because these formations are capped by more-resistant Oswego sandstone, the current landforms consist of sandstone-capped terraces that have remained intact over time.

Underlying geologic features at Lyons Falls Mill consist primarily of metamorphic gneisses that are representative of the geologic processes associated with the formation of the Adirondacks (Van Diver 1992). West of the riverbed, the surficial geology underlying the Black River is dominated by a long north-south running band of limestone known as the Trenton Group Limestone. Exposed features from both of these formations are routinely visible, including the approximately 60-foot-high bedrock outcrop at Lyons Falls that forms the foundation of Lyons Falls Mill. Further west, the underlying geology of the river valley consists primarily of sedimentary shale and siltstone associated with the Tug Hill Plateau (Van Diver 1992).

Soils

Three major soils series are known to occur at Lyons Falls Mill: Colton, Rumney, and Podunk (NRCS 1999) (Figure E.2-3).

- Colton Series soils are well-drained, gravelly-loam, fine sand soils that have developed on glacial outwash and deltaic deposits originating from the gneiss and granite of the Adirondack Upland (NRCS 1954). Slope is generally 0 to 8 percent. At Lyons Falls Mill, they are found in the forested hillsides due east of the Black River and on the west side of the river behind the former paper mill and hydro facilities.
- Rumney Series soils are very deep and poorly drained silt loams that have formed on recent alluvial deposits. This soil type consists of a relatively thin layer of loam overlying layered sands and gravels. Rumney soils are typically found within the riverine floodplain and are often subject to periodic flooding. Slope is generally less than 0.02 percent. At Lyons Falls Mill, Rumney soils are found along the west bank of the Black River just below Lyons Falls (NRCS 1954). They reappear along the river edge approximately ¹/₄ mile downstream of Lyons Falls.
- **Podunk Series soils** are very deep, level, and made up of fine sandy loam. They are found on recent alluvial deposits of schist, gneiss, and granite. At Lyons Falls Mill, they are found just downstream of Lyons Falls on the east side of the river.





Other soils in the vicinity of Lyons Falls Mill are mapped as an unclassified Fluvaquents and Udifluvents complex and unclassified Udorthents. The poorly drained and frequently flooded Fluvaquents and Udifluvents complex is formed on the footslope of floodplains from alluvium located downstream from Lyons Falls on river right. The complex is characterized by a relatively thin layer of mucky loamy sand overlying a deep layer of very gravelly sand.

Unclassified Udorthents soils are mapped along river right at the location of the former paper mill and the existing Lyons Falls Mill's powerhouses. Udorthents are characterized as "made land" or similar soils with a thin layer of channery loam overlying a deep layer of gravelly sandy loam. Construction activities associated with the proposed redevelopment of Lyons Falls Mill would take place entirely within the footprint of the former paper mill in areas mapped as made land.

Impoundment Sediments

In support of the upgrades proposed in 2006, NBLF conducted an evaluation to characterize accumulated sediment within Lyons Falls Mill impoundment. The results of the survey indicate that there is relatively little accumulated fine-grained sediment in the impoundment. That which does exist is dominated by sand. The bulk of this material is located along the right shoreline of the impoundment, opposite of the existing intake structure and the proposed location for construction of the new integrated intake/trashrack. In general, the impoundment is dominated by larger-sized substrates (gravels and cobbles) that are not heavily embedded with fines. Average sediment depth in the impoundment is less than 0.5 foot. A small sediment wedge consisting primarily of gravels and sand exists along a portion of the upstream face of the dam. The results of the impoundment sediment characterization are presented in additional detail in Appendix B.

Wetlands

To evaluate the distribution and composition of existing wetland complexes at Lyons Falls Mill, NBLF queried existing state and federal databases for existing wetland geographic information

system (GIS) information. The banks of the Black River at Lyons Falls are generally steep and well defined. As such, there are no extensive wetlands associated with the area. Smaller wetland complexes along the impoundment margin, tailrace area, and river banks include pockets of palustrine forested (mixed hardwood swamp), scrub-shrub (small trees and shrubs less than 20 feet in height), and emergent (marsh vegetation) wetlands. Existing wetlands at the site are described in greater detail in Section E.2.5, below.

Vegetative Cover

Botanical resources at Lyons Falls Mill include upland forests dominated by mixed canopy types and riparian habitat, including stands of coniferous evergreens and deciduous broadleaf trees common to the northeast. Most prominent are stands of white pine, yellow birch, eastern hemlock, black cherry, red maple, sugar maple, and northern white cedar (Georgia-Pacific 1983). Shoreline vegetation is limited by shallow bedrock soils, exposed bedrock, boulder, and sandy areas. Shoreline areas that support vegetation often consist of shrub species including speckled alder, low-bush blueberry, and honeysuckle. The majority of these areas are inundated during periods of high water (Georgia-Pacific 1983). Additional details pertaining to botanical resources are provided below in Section E.2.5.

Land Use and Development

Lyons Falls Mill is located in the Village of Lyons Falls and is a part of the Town of West Turin. The east side of the Lyons Falls Dam along river right abuts the jurisdictional boundaries of the Town of Lyonsdale. With the exception of the former Georgia-Pacific paper mill on the west side of the Black River at Lyons Falls, the area is generally forested with interspersed rural development, primarily limited to several small villages and hamlets. The paper mill, which ceased operations in 2001 and is now owned by Lewis County, is characterized as an industrial area and is currently scheduled for demolition.

Although the Black River is one of the New York's smaller river basins, the region supports a diversity of land use practices. The eastern portion of the Black River Basin consists of densely

forested woodlands. Land use in this portion of the river basin consists mainly of silviculture, recreation, and tourism.

Lewis County is heavily forested and dominated by second growth northern hardwoods which comprise approximately 55 percent of the land cover, followed by agricultural lands at approximately 19 percent of the land cover, and residential lands at 14 percent.

Demographics

The Village of Lyons Falls is one of the smaller population centers in the Black River Valley between the Adirondack Mountains and the Tug Hill Plateau (NYSDEC 2007a). The U.S. Census Bureau reports that the Village of Lyons Falls has a population of approximately 566 (US Census Bureau 2010). The Town of West Turin, the Town of Lyonsdale, and Lewis County have populations of approximately 1,524; 1,227; and 27,087, respectively (US Census Bureau 2010).

Presence of Floodplains & Occurrence of Flood Events

Flood stage on the Black River near Lyons Falls (i.e., Boonville) occurs when water levels rise more than 10 feet above an elevation of 935.5 feet at USGS gage 04252500 at Boonville, New York (USGS 2007). At 10 feet above normal water elevation, flood stage begins and is classified as minor, which typically results in flooding of roadways and significant flooding of flat rural lands. At 11 feet above normal water elevation, flooding is considered moderate and can result in residential damage with widespread flooding of roadways and rural areas. At 12 feet above normal water elevation, flooding is considered major, resulting in large scale residential, commercial, and industrial flooding with major road closures (USGS 2007). Flood inundation maps developed by the Federal Emergency Management Agency (FEMA) indicate that lands both upstream and downstream of Lyons Falls Mill are classified as high-risk (FEMA 2007).

Although flooding in Lyons Falls is relatively common, the current operation of Lyons Falls Mill does not increase the chances of flooding because water is not stored in the impoundment for generation. Lyons Falls Mill is operated in a run-of-river mode so that flows into the impoundment are matched by flows discharged into the tailrace. NBLF does not propose to change the run-of-river operation, water elevation in the impoundment, storage capacity, or configuration of any spillway features that would increase the potential for flooding at the site. The current license allows for NBLF to install 26-inch flashboards to pond water and increase head for generation. Operationally, this would not change with the proposed redevelopment.

E.2.2 Report on Water Use and Quality

Existing and Proposed Uses of Project Waters

NBLF proposes to redevelop Lyons Falls Mill to increase the facility's efficiency and energy output as described in Exhibit A. There are no other existing or proposed uses of Black River or Moose River water at Lyons Falls Mill other than hydroelectric generation (i.e., for irrigation, domestic water supply, or steam-electric plants). Instream flow uses include hydroelectric flows and recreation.

The Village of Lyons Falls and the Town of Lyonsdale are supplied with water from nearby natural springs¹. Wastewater is discharged from the Village of Lyons Falls into the Black River approximately 1,000 feet downstream of Lyons Falls Mill after being treated at the Lyons Falls Water Treatment Facility. Approximately 43,000 gallons per day of treated wastewater are discharged back into the Black River below Lyons Falls². The Town of Lyonsdale discharges its wastewater directly into the town's septic tanks³.

¹ Personal communication, Village of Lyons Falls, Department of Public Works, March 2007.

² Personal communication, Village of Lyons Falls, Department of Public Works, March 2007.

³ Personal communication, Village of Lyons Falls, Department of Public Works, March 2007.

Black River Flows

Black River flows at Lyons Falls Mill have been prorated using data from Black River USGS Gage 04252500. Monthly and annual flow duration curves are presented in Appendix A to this document.

NBLF currently operates Lyons Falls Mill in a run-of-river mode so that inflow into the impoundment matches outflow from the powerhouses. Currently, river flows ranging from approximately 70 cfs (approximate minimum operating point of unit 9) to 1,170 cfs (maximum capacity of all 5 generating units) are passed through the existing units. Water diverted from the impoundment into the existing turbines is discharged at the western base of the falls. Flows below 70 cfs or exceeding the 1,170 cfs existing hydraulic capacity of the plant are spilled over the facility's spillway or through the facility's sluice gate.

Water Quality Standards

The New York State Department of Environmental Conservation (NYSDEC) has established a water quality classification system based on a best use designation. The five designations given by the state of New York for riverine systems include AA, A, B, C, and D. Each class has its own designated standards for water quality. Designations followed by a (T) are indicative of standards designed to ensure water quality is suitable for trout.

The Black River is considered Class C waters from Carthage to upstream to the Moose River confluence (i.e., Lyons Falls Mill impoundment). Class C waters are designated as best suited for fishing and human consumption of fish. Above the Moose River confluence, the Black River is classified as Class C(T) water, indicating that water quality standards must be maintained for trout. The lowermost 1.8 RM of the Moose River to its confluence with the Black River are also classified as Class C(T) water. Dissolved oxygen (DO) levels of 5.0 mg/L are required for Class C waters whereas a level of 6.0 mg/L or higher must be maintained for Class C(T) waters. The standard for pH is between 6.5 and 8.5 for Class C and C(T) waters (Lowie et al. 1994).

Existing Water Quality

Water quality issues caused by human activities in the Black River Basin are generally limited in part due to the regions low population density (NYSDEC 2007a). In general, the bulk of water quality issues in the Black River are associated with atmospheric deposition of contaminants (NYSDEC 2007a). In addition, other potential sources of water pollution in the Black River can be associated with agriculture, sediments, chemical spills, and inadequate waste treatment facilities (NYSDEC 2007a).

Because of underlying geologic features, water entering the system from the eastern side of the drainage (e.g., the Adirondacks) is acidic in nature as a result of the predominance of metamorphic schists and gneisses. However, inflow from the Tug Hill Plateau, which is comprised primarily of limestone and slate, results in the input of more alkaline water. NYSDEC has recorded pH levels below 5.0 in numerous lakes and ponds in the Black River Basin, which is attributed to acid deposition (NYSDEC 2007a). The uppermost reach of the Black River (above Kayuta Lake) is also reportedly impacted by low pH and acid rain/run-off, which has affected existing aquatic biota (NYSDEC Bureau of Fisheries 1993). Low pH levels are known to impair and preclude the development of biota in aquatic systems (NYSDEC 2007a).

There are no specific fish consumption advisories for the Black River or Moose River (New York State Department of Health [NYSDOH] 2014). The NYSDOH recommends limiting consumption of most sportfish from the Adirondack Region (including the Moose and Black rivers in the vicinity of Lyons Falls Mill) to no more than four meals (one-half pound) per month (NYSDOH 2014). In addition, the NYSDOH recommends that women of childbearing age, infants, and children under the age of 15 do not consume yellow perch over 10 inches, northern pike, pickerel, walleye, largemouth or smallmouth bass from any Adirondack waters because of elevated mercury levels (NYSDOH 2014).

NYSDEC regularly monitors water quality in New York through the implementation of its Rotating Intensive Basin Studies (RIBS) monitoring program, which is designed to collect and
evaluate chemical and biological information for major riverine systems (NYSDEC 2007a). Monitoring is conducted approximately every five years in each of New York's major river drainages (NYSDEC 2007c). The most recent Black River RIBS data are from 2002 and 2003, when NYSDEC conducted water quality monitoring in the 22.5-mile-long reach of the Black River from Lowville to Lyons Falls. In general, water quality in the Black River is considered non-problematic as compared to other major New York river basins⁴.

Black River

Biological, chemical, and physical information collected by NYSDEC in recent years indicates that water quality in the Black River in the vicinity of Lyons Falls Mill is generally in very good to excellent condition. Biological (macroinvertebrate) sampling indicated "slightly impacted water quality" in the Black River near Lyons Falls because the invertebrate community was dominated by caddisflies, midges, and mayflies, which was indicative of minor water quality impacts (NYSDEC 2007a). Additionally, NYSDEC evaluated characteristics of the fish community to assess water quality near Lyons Falls. Results indicate that characteristics of the existing fish community in the Black River from Lowville to Lyons Falls are reflective of "good water quality" (NYSDEC 2007a). The Black River at Lyons Falls was not listed as impaired by NYSDEC in a recent 303(d) report filed pursuant to the state's Clean Water Act reporting requirements (NYSDEC 2006).

NYSDEC's sampling in the Black River from Lowville to Lyons Falls indicated that mercury and aluminum were parameters of concern (NYSDEC 2007a). However, according to NYSDEC's report, the elevated levels of these two elements are not unusual for areas of the state typically affected by atmospheric deposition of mercury and subject to acid rain (NYSDEC 2007a). NYSDEC reports zinc in elevated concentrations in this reach of the river, but concluded that "based on sediment quality guidelines developed for freshwater ecosystems, overall sediment quality is not likely to cause chronic toxicity to sediment-dwelling organisms." NYSDEC concludes that results from the most recent round of RIBS sampling indicate that, in

⁴ Personal communication, Ray Gabriel, Water Quality Specialist, NYSDEC, April 2006.

the Black River from Lowville to Lyons Falls, there are "no significant water quality impacts and uses of the stream are considered to be fully supported" (NYSDEC 2007a).

In its report entitled "30 Year Trends in Water Quality of Rivers and Streams in New York State Based on Macroinvertebrate Data 1972-2002," NYSDEC categorized water quality in the Black River from Dexter to Port Leyden, which includes Lyons Falls, as slightly impacted (NYSDEC 2004). Upstream from Lyons Falls to Hawkinsville, NYSDEC classified water quality in the Black River as non-impacted.

In 1996, benthic invertebrate sampling was conducted by NYSDEC upstream and downstream of the former discharge lagoon of Georgia-Pacific's paper mill to evaluate the potential impacts associated with the plant's discharge (NYSDEC 2004). It was determined that no significant impairments had resulted from the paper mill's discharge (NYSDEC 2004). Because the mill has subsequently shut down, it is likely that water quality at Lyons Falls Mill has remained non-impacted or has improved.

Moose River

In 2003, NYSDEC conducted its most recent RIBS, which included the lower Moose River near Lyons Falls (NYSDEC 2007a). Results of macroinvertebrate sampling indicated that non-impacted water quality conditions were prevalent in the lower portion of the Moose River from its confluence with the Black River to McKeever (NYSDEC 2007a). According to NYSDEC, the macroinvertebrate community is "well-balanced, diverse, and dominated by clean-water mayflies."

NYSDEC's sampling in the lower Moose River indicated that mercury and aluminum were parameters of concern (NYSDEC 2007a). However, according to NYSDEC's report, the elevated levels of these two variables are not unusual for areas of the state typically affected by atmospheric deposition of mercury and subject to acid rain (NYSDEC 2007a). The report also concludes that "sediment chemistry analysis for these and other contaminants show no metals present above established levels of concern, and no compounds present in concentration likely to cause adverse biological effects to sediment-dwelling organisms" (NYSDEC 2007a).

NYSDEC also collected macroinvertebrate data from the lower Moose River, above Lyons Falls, in 1976, 1982, and 1991 (NYSDEC 2004). All benthic macroinvertebrate monitoring data indicate that the Moose River is non-impacted and reflective of excellent water quality (NYSDEC 2004).

Studies Conducted by NBLF

As described above, NBLF conducted select studies in support of the upgrades to Lyons Falls Mill proposed in 2006. Relevant studies related to water use and quality are described below.

Dissolved Oxygen, pH, Water Temperature, and Conductivity

NBLF recorded existing DO, pH, conductivity, and water temperature conditions at Lyons Falls Mill during the summer high-temperature, low-flow period of 2006 to further document and update baseline conditions. A mid-summer sample (August 23 and 24) was chosen because it was likely to represent a "worst-case" scenario, and it was expected that results from this period would exemplify the lowest DO concentrations likely to occur over the annual cycle because of decreased DO solubility with increasing water temperature (Wetzel 2001). As per NYSDEC guidelines, measurements were taken at five intervals throughout a 24-hour period at six sample sites⁵.

Handheld water quality meters were used to gather conductivity, pH, DO, and water temperature information at six sites at Lyons Falls Mill (Figure E.2-4 and Table E.2-1). In the Lyons Falls impoundment, DO and water temperature measurements were taken at 1-foot intervals from the surface to the bottom to create vertical profiles. Data in the riverine sample sites were taken at a depth of 1 foot. At all sites, conductivity and pH were also measured at a depth of 1 foot. Data were collected on five occasions (morning, late-morning, early afternoon, early evening, and evening) spanning approximately a 24-hour period from the afternoon of August 23 to the late-morning of August 24 (Table E.2-1).

⁵ Personal communication, Rose Anne Gray, Water Quality Specialist, NYSDEC, May 2006.

FIGURE E.2-4 DO, PH, CONDUCTIVITY, AND WATER TEMPERATURE MONITORING STATIONS ESTABLISHED AT LYONS FALLS MILL, LYONS FALLS, NEW YORK, AUGUST 23 & 24, 2006



TABLE E.2-1 DESCRIPTION OF SAMPLING SITES, DATES, AND TIMES OF WATER QUALITY MONITORING AT LYONS FALLS MILL, LYONS FALLS, NEW YORK, AUGUST 23 & 24, 2006

Site ID	Location	Date Sampled	Time Sampled
BR1 (Black River)	Upstream of Moose and Black	8/23/2006 & 8/24/2006	0730, 1030, 1800,
	River confluence.		2045, 2315
BR2 (Black River)	Downstream of the dam across	8/23/2006 & 8/24/2006	0745, 1045, 1830,
	from the existing canoe launch		2110, 2330
	site.		
MR1 (Moose	Upstream of Moose and Black	8/23/2006 & 8/24/2006	0715, 1000, 1800,
River)	River confluence.		2030, 2300
IL (Impoundment	Upstream of dam face.	8/23/2006 & 8/24/2006	0615, 0900, 1630,
Lower)			1930, 2200
IM (Impoundment	Mid-impoundment.	8/23/2006 & 8/24/2006	0630, 0915, 1700,
Middle)			2000, 2215
IU (Impoundment	Upper end of impoundment	8/23/2006 & 8/24/2006	0700, 0930, 1730,
Upper)	below confluence of Moose		2015, 2230
	River.		

Mean DO at all sites for all five sampling episodes within Lyons Falls Mill ranged from 8.5 mg/L (93.5 percent saturation) to 8.7 mg/L (96.5 percent saturation) and showed little variation during the diurnal cycle and at various depth intervals (Table E.2-2, Figure E.2-5, Figure E.2-6, and Figure E.2-7). Overall, DO dropped by less than 0.5 mg/L between the evening hours (first sample time) to the morning hours (fifth sampling time) for all sites (Figure E.2-5, Figure E.2-6, and Figure E.2-7). Variation of DO by depth was minimal. All DO measurements exceeded the New York State standard for Class C and Class C(T) waters (5.0 mg/L for Class C waters; 6.0 mg/L for Class C(T) waters).

Mean water temperature ranged from 20°C to 20.5°C throughout waters associated with Lyons Falls Mill and dropped by less than 1°C between evening and morning sampling events (Table E.2-2; Figure E.2-8, Figure E.2-9, and Figure E.2-10). Variation of water temperature by depth was minimal (Figure E.2-8, Figure E.2-9, and Figure E.2-10). The only site that showed a perceivable temperature difference between depth intervals was the middle impoundment (IM) during the early evening sampling event (1730) when the temperature dropped by approximately 1°C.

Mean pH values for all sites ranged from 7.1 to 7.7 (Table E.2-2). Mean values met New York State standards for pH; however, three individual measurements were below the state's minimum threshold for Class C and Class C(T) waters (between 6.5 and 8.5). At the Moose River site (MR 1), pH was between 6.2 and 6.4, during the 0715 and 1000 sampling events, respectively (Figure E.2-11). At the lower Black River site (BR2), pH was 6.2 during the 1045 sampling event. Low pH values may have been a result of run-off associated with precipitation that occurred during sampling. Because acid rain deposition is a noted and persistent water quality issue in the Black River Basin (NYSDEC 2007a), the observed pH measurements are not unexpected; however, there is no nexus between low pH measurements and NBLF's operation of the Project or Lyons Falls Mill.

Conductivity varied distinctly by sample location. Measurements at the Moose River site upstream of the impoundment were noticeably lower than measurements in the Black River. As waters from both river systems mixed, conductivity values became lower in the impoundment and below the Lyons Falls Dam. Average conductivity for the entire sample period ranged from 34.8 (Moose River) to 96.5 microsiemens (uS) (Black River) (Table E.2-2).

TABLE E.2-2 SUMMARY OF MEAN DISSOLVED OXYGEN, PH, CONDUCTIVITY, AND WATER TEMPERATURE SAMPLING RESULTS AT LYONS FALLS MILL, LYONS FALLS, NEW YORK, AUGUST 23 & 24, 2006

Site ID	DO (%)	DO (mg/L)	Temp. (°C)	Conductivity (uS)	рН	
Riverine Sites	5					
BR1	96.5	8.7	20.5	96.5	7.3	
BR2	93.5	8.5	20.0	63.9	7.3	
MR1	95.8	8.7	20.0	34.8	7.1	
Impoundment Sites						
IU	95.8	8.7	20.0	45.8	7.7	
IM	96.1	8.7	20.3	79.9	7.6	
IL	95.7	8.7	20.0	35.9	7.5	

FIGURE E.2-5 DISSOLVED OXYGEN BY DEPTH AND SAMPLING TIME IN THE UPPER IMPOUNDMENT, LYONS FALLS MILL, LYONS FALLS, NEW YORK, AUGUST 23 & 24, 2006



FIGURE E.2-6

DISSOLVED OXYGEN BY DEPTH AND SAMPLING TIME IN THE LOWER IMPOUNDMENT, LYONS FALLS MILL, LYONS FALLS, NEW YORK, AUGUST 23 & 24, 2006



FIGURE E.2-7 DISSOLVED OXYGEN BY DEPTH AND SAMPLING TIME IN THE MIDDLE IMPOUNDMENT, LYONS FALLS MILL, LYONS FALLS, NEW YORK, AUGUST 23 & 24, 2006



FIGURE E.2-8

WATER TEMPERATURE BY DEPTH AND SAMPLING TIME IN THE UPPER IMPOUNDMENT, LYONS FALLS MILL, LYONS FALLS, NEW YORK, AUGUST 23 & 24, 2006







FIGURE E.2-10

WATER TEMPERATURE BY DEPTH AND SAMPLING TIME IN THE LOWER IMPOUNDMENT, LYONS FALLS MILL, LYONS FALLS, NEW YORK, AUGUST 23 & 24, 2006





FIGURE E.2-11 SURFACE PH VALUES FOR ALL SITES, LYONS FALLS MILL, LYONS FALLS, NEW YORK, AUGUST 23 & 24, 2006

With the exception of a few individual pH measurements, all sampling events indicated that DO and pH met or exceeded New York State water quality standards for Class C and Class C(T) waters. Rainfall and associated runoff on the night of August 23 and into the morning of August 24 may have influenced pH levels in Lyons Falls Mill as the upper Moose River watershed is considered as an acidic⁶. Variation in conductivity amongst the sample sites is likely a result of differences in upstream watershed characteristics (e.g., dominant soil types and underlying geologic features).

The results of monitoring undertaken by NBLF in 2006 indicate that DO, pH, water temperature, and conductivity are not adversely affected by the operation of Lyons Falls Mill. Values observed upstream, downstream, and within the Lyons Falls impoundment showed little variation and were in compliance with New York State standards. Because monitoring took place during the low-flow, high-temperature period – which is typically when adverse conditions would develop – it is expected that these variables would also meet New York State standards

⁶ Personal communication, Alice Richardson, Ecologist, NYSDEC, January 2006 Preliminary Resource Meeting.

throughout the remainder of the year. The DO and temperature profiles in the impoundment indicate that neither thermal nor chemical stratification occurs during the low-flow, high-temperature period of late summer. Water depth in the impoundment is generally less than 14 feet, reducing the likelihood of summer stratification and the development of zones of low DO concentrations.

Benthic Macroinvertebrate Sampling

NBLF conducted a baseline survey of benthic macroinvertebrates (BMI) in 2006 to assess species composition and distribution in Lyons Falls Mill tailrace and impoundment. A comparison of the two communities (impoundment and tailrace) based on common metrics was completed after collection, sorting, and identification of specimens. This information was used to assess differences in the benthic macroinvertebrate assemblages immediately upstream and downstream of the dam and to draw basic conclusions about water quality at Lyons Falls Mill. Aspects of the community that were of interest included species composition, species richness, percent contribution of Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies) (EPT), and the high quality of the tailrace community as demonstrated by the composition of the BMI community. In general, it was found that the BMI community at Lyons Falls Mill is reflective of excellent water quality. These findings are in agreement with assessments conducted by the NYSDEC (NYSDEC 2007a).

Sampling was conducted in the Moose River and Black River upstream of their confluence, in the Lyons Falls impoundment, and in the Lyons Falls tailrace (Figure E.2-12). Twelve samples were collected with aquatic kick nets in a 1-meter square sample area. Each kick net station was sampled for 1 minute. Once collected, samples were field preserved; raw samples were sorted in the lab; and a subsample of 100 macroinvertebrates was removed from each sample. The 100 macroinvertebrates were then identified to the lowest practicable taxonomic distinction (typically to Family). Individual organisms were classified and evaluated according to the U.S. Environmental Protection Agency's (EPA) Standard Operating Procedures for sampling benthic macroinvertebrates (Barbour et al. 1999).

FIGURE E.2-12 MACROINVERTEBRATE SAMPLING STATIONS AT LYONS FALLS MILL, LYONS FALLS, NEW YORK, NOVEMBER 2006



Descriptive properties for invertebrate collections reported include total taxa richness (R). In addition, a modified Family Biotic index (Plafkin et al. 1989) was assigned to the invertebrate samples. In that this biotic index was developed for streams and rivers, and is not applicable to impounded reaches, the tolerance value was only developed for the tailrace collections. In accordance with the Hilsenhoff scale, species tolerance values range from 0–10, with a value of zero indicating excellent water quality (organic pollution unlikely), and a value of 10 indicating very poor water quality (severe organic pollution likely) (Hilsenhoff 1988). Family and species level tolerance values were obtained from published values summarized in Mandaville (2002). In addition to the Hilsenhoff biotic index, the percent contribution of EPT (% EPT) to the total sample was also reported. These three groups of macroinvertebrates are typically used in assessing the health of a river because they are the most sensitive to water pollution. As a final measure, both EPT richness and the ratio of EPT to Chironomidae (midge larvae) abundance were assessed.

The results of this baseline study indicate that there are marked differences in the benthic macroinvertebrate communities observed in the impoundment and the tailrace. In large part, community composition appears to mirror flow regime and substrate type. The following sections discuss the differences between the tailrace and the impoundment in greater detail.

Taxa observed in the tailrace community are dominated by the Ephemeroptera, Plecoptera, Trichoptera, and to a lesser extent, the Diptera (two–winged or "true flies") (Figure E.2-13). Other taxa noted include an admixture of the Odonata (dragonflies), Oligochaeta (aquatic worms), and the Gastropoda (snails and limpets) amongst others. Within the impoundment, members of the Oligochaeta, Amphipoda (scuds and sideswimmers), Ephemeroptera, and the Diptera were noted in addition to the Hirudinea (leeches and bloodsuckers) and Bivalvia (clams and mussels). The Lepidoptera were absent from the impoundment and only a single individual was identified in the tailrace. A complete list of taxa observed at Lyons Falls Mill is presented in Appendix C.

FIGURE E.2-13 COMPARISON OF THE RELATIVE PERCENT COMPOSITION OF THE DOMINANT BENTHIC MACROINVERTEBRATE TAXA AT LYONS FALLS MILL, LYONS FALLS, NEW YORK, NOVEMBER 2006



There was a distinct difference in the composition of the benthic invertebrate assemblage observed within the tailrace and the impoundment, which is reflected in the low Morisita coefficient (MSij = 0.256). An examination of the two benthic communities indicates that the differences are largely driven by nine groups of dominant taxa (Figure E.2-13). Within the tailrace community the nine groups account for 97% of the total sample, while they comprise 91% of the impoundment community sample. Of the nine groups, the Oligochaeta, Ephemeroptera, Plecoptera, and the Diptera can be said to be the drivers underlying the low similarity coefficient. Simply, there are far greater numbers of Oligochaeta and Diptera in the impoundment samples, whereas the Ephemeroptera, and especially the Plecoptera dominate the tailrace samples.

With respect to other groups observed that contributed less to the overall community, there were greater numbers of Amphipoda in the impoundment samples, whereas most of the Hemiptera (water or "true bugs") were observed in the tailrace. The relative percentages of Coleoptera

(beetles), Odonata, and to a lesser extent, Trichoptera were approximately equal in both habitat types.

Using the benthic invertebrate assemblages, the tailrace family biotic index (FBI = 3.02) indicates that water quality is excellent. The % EPT percentage is much higher in the tailrace than in the impoundment, whereas the % Chironomidae is much higher in the impoundment (Table E.2-3). Taxa richness and EPT richness are approximately equal.

TABLE E.2-3 SUMMARY OF MEAN BMI COMMUNITY METRICS AT LYONS FALLS MILL, LYONS FALLS, NEW YORK, NOVEMBER 2006

Metric	Tailrace	Impoundment
% EPT	77	17
% Chironomidae	9	37
Ratio EPT:Chironomidae	17	0.7
Taxa Richness	14	14
EPT Richness	6	4

The results of this baseline study indicate that there are marked differences in the composition of the tailrace and impoundment benthic invertebrate communities. It is believed that the factor most proximate to the observed differences includes habitat type (e.g., flow regime and substrate). With respect to gauging water quality, the family biotic index used in this analysis is specifically geared towards identifying the effects of organic pollutants. The family biotic index, however, can also be interpreted as an index of differences driven by habitat type (e.g., lotic versus lentic) rather than the effects of organic pollutants.

As observed within the impoundment, many species representative of lentic (ponded or impounded waters) flow regimes and relatively warmer waters with soft substrates dominated the community, including the Oligochaeta and the Diptera (Mandaville 2002). Both taxa will utilize soft sediments as refugia should water temperatures become elevated, as often can be observed in impounded waters. These taxa typically thrive in this type of habitat. The Diptera in particular, can be found in just about every conceivable freshwater habitat type, and the family Chironomidae, which dominated the impoundment, includes a number of subfamilies that are

generally most common in lentic, warm–water habitats (Mandaville 2002). The composition of the benthic macroinvertebrate impoundment is not unusual for this type of habitat, however, and the benthic assemblage is comparable to that observed in other impounded waters (Mullan 1986).

In general, the tailrace macroinvertebrate community exhibited a rich assemblage of species typical of fast moving (lotic) cold waters that are rich in dissolved oxygen. Significant numbers of invertebrates that are typically associated with non-impacted habitats including members of the Orders Ephemeroptera and Plecoptera were observed in the tailrace. In waters showing impairment, these species would be expected in lower numbers. The high water quality requirements of Plecopteran (stonefly) nymphs restrict them to an extremely narrow niche, free from low dissolved oxygen concentrations, sediment loading, high temperatures, and eutrophication. In short, based on the benthic macroinvertebrate community characteristics, it appears that the tailrace invertebrate biota and water quality are in excellent condition, supporting an extremely sensitive benthic assemblage only observed in the cleanest, least degraded of lotic habitats. Significantly, the high-quality nature of the invertebrate community in the tailrace indicates that the waters being released from the bottom of the impoundment are fairly well–oxygenated, free from excessive nutrient levels, and other pollutants.

Minimum Flow Releases

The existing license for the Project does not require any minimum flow releases at Lyons Falls Mill. Proposed minimum flow releases are discussed below.

Existing and Proposed PM&E Measures

Existing water quality data and studies conducted by NBLF indicate high water quality at Lyons Falls Mill. As such, NBLF proposes to continue to operate the facility in a run-of-river mode so that outflow from the impoundment is consistent with inflow for the protection of aquatic resources.

The existing license for the Project does not require a continuous flow to be released from Lyons Falls Mill. In support of the redevelopment of the facility, NBLF proposes to release seasonal minimum flows totaling 70 cfs downstream from the Lyons Falls Dam. Of the 70 cfs, a minimum of 45 cfs would be released annually from March 15 through November 30 to provide a fish movement continuity flow to facilitate the downstream movement of fish. A minimum flow of 25 cfs would also be released annually during the recreation season (May 1 through October 31) to provide a continuous flow over a portion of Lyons Falls for aesthetic purpose. NBLF will consult with resource agencies and other stakeholders to define the appropriate location(s) and mechanism(s) for the seasonal minimum flow releases. NBLF anticipates that the seasonal minimum flow releases (including 25 cfs over Lyons Falls) will provide additional aeration benefits.

Construction of the new Lyons Falls Mill facility will require temporary cofferdaming and a cessation of flow through the intake structure, penstocks, and existing generating units. During the construction period, NBLF will pass all flows over the spillway.

NBLF will prepare a Construction Soil Erosion and Sedimentation Control Plan and a Temporary Emergency Action Plan for FERC and NYSDEC approval following FERC's order amending the license and prior to the start of construction activities. Construction activities will comply with the terms of the existing Section 401 Water Quality Certification (WQC) issued for the Lyons Falls Project by NYSDEC on February 12, 1985, or any new 401 WQC issued by NYSDEC for this proposed amendment. NBLF will implement standard best-management practices (BMP) to address sediment and erosion control during construction and final stabilization in accordance with NYSDEC technical guidance.

Continued or Incremental Impacts on Water Quality

NBLF is not aware of any ongoing impacts on water quality related to operation of Lyons Falls Mill, and the proposed redevelopment is not expected to have any continued or incremental impacts. Existing documentation of water quality in the Black River in the vicinity of Lyons Falls, including information collected by NBLF in support of the upgrades proposed in 2006, demonstrates that the current operation of the hydroelectric facility does not adversely affect water quality. Although there are water quality issues in the Black River Basin (e.g., acid deposition), these issues are not directly related to the development of hydroelectric resources. Water quality in the Black River is very good to excellent with minor reported impacts. Information gathered by NBLF in 2006 (e.g., dissolved oxygen, temperature, pH, and macroinvertebrate data) as described above support overall water quality assessments conducted by NYSDEC in recent years.

Similarly, the proposed redevelopment would not adversely affect or result in any incremental decrease in water quality. Although the proposed upgrade would result in the utilization of additional water resources, the site would continue to operate as a run-of-river facility for the protection of existing aquatic resources. All flows utilized by the new units would be discharged directly back into the tailrace on the downstream edge of the falls, similar to the existing flow During the warm, dry months of summer, NBLF's proposed minimum flow patterns. requirements would allow 70 cfs to be released continuously downstream from Lyons Falls Dam. NBLF anticipates that this minimum flow would continue to maintain aeration and other benefits that have resulted in high water quality downstream from Lyons Falls Mill. As a result, NBLF anticipates no adverse or incremental effects to water quality as a result of the diversion of water through the new units. Water quality (e.g., dissolved oxygen, pH) in the impoundment would not be adversely affected, as no changes in pond elevation are proposed. Water quality and macroinvertebrate communities downstream of Lyons Falls Mill would not be affected by the proposed upgrade or subsequent operations as all water utilized for the production of power would be discharged directly back into the tailrace, as is done under current operations.

There would likely be short-term impacts to turbidity and sediment mobilization as a result of construction. However, NBLF proposes to implement BMPs to prevent erosion and sediment mobilization, and all BMPs would be implemented in accordance with NYSDEC technical guidelines and in accordance with any amended WQC issued by NYSDEC.

E.2.3 Report on Fisheries Resources

Historically, 48 fish species were known to occur in the Black River Basin (Lowie et al. 1994). Prior to anthropogenic activity in the watershed, the 60-foot-high waterfall at Lyons Falls divided the Black River fishery into two distinct assemblages, an upland coldwater fishery and a lowland coolwater fishery (Lowie et al. 1994). More recently, the introduction of nonnative fish species though active fisheries management, or otherwise, has resulted in a more homogenous fish community with approximately 70 species distributed throughout the upper and lower watershed (Lowie et al. 1994).

Diadromous and migratory fish species known to occur, or that historically occurred in the Black River, include landlocked Atlantic salmon (native), American eel (native), alewife (native), sea lamprey (native), Chinook salmon (nonnative), steelhead (nonnative), and Coho salmon (nonnative). The extent of the natural upstream migration for diadromous species in the Black River is limited by High Falls in Watertown, approximately 60 RM downstream of Lyons Falls⁷. The recent installation of fish passage structures at the Dexter Project (FERC No. 2695) and the Glen Park Project (FERC No. 4796) below Watertown has restored fish migratory routes to their historic spatial extent.

Near Lyons Falls, the Black River and the Moose River support resident game, non-game, and introduced sport fish species typical of the northeastern United States. Coolwater species (e.g., smallmouth bass and rock bass) have been introduced over time into the upper reaches of the river above Lyons Falls (NYSDEC Bureau of Fisheries 1993).

In 1992 and 1993, NYSDEC conducted a comprehensive fisheries study of the entire Black River from Dexter to North Lake (NYSDEC Bureau of Fisheries 1993). Because Lyons Falls was reported as the dividing point between the middle and upper reaches of the Black River, results from both reaches are used here to describe the fishery around Lyons Falls.

⁷ Personal communication, Frank Flack, fisheries biologist, NYSDEC, April 2006.

According to the NYSDEC, the fish community below Lyons Falls is composed of approximately 34 species (NYSDEC Bureau of Fisheries 1993). NYSDEC indicates that the fish community is diverse with few dominant fish species. Common species include rock bass, walleye, yellow perch, tessellated darter, smallmouth bass, rock bass, brown bullhead, pumpkinseed, white sucker, and fallfish (Table E.2-4). Upstream of Lyons Falls, the fish community consists of approximately 28 species and is dominated by white sucker, rock bass, and smallmouth bass (NYSDEC Bureau of Fisheries 1993) (Table E.2-4). The upper reach does contain a higher proportion of trout, although the results of the NYSDEC survey indicate that it is only about 11 percent of the total composition. Additional fish surveys conducted by NYSDEC in the Black River in 1995 and 1998 in the Lyonsdale and Port Leyden area indicate that Northern hog sucker, pumpkinseed, fallfish, chain pickerel, rock bass, and walleye are commonly occurring species in this reach (NYSDEC Bureau of Fisheries 2006).

Fish species noted as common below the dam at Lyons Falls during previous licensing efforts included northern pike, bullhead, smallmouth bass, brown trout, rainbow trout, brook trout, sunfish, carp, and yellow perch (Georgia-Pacific 1983).

The Moose River is managed by NYSDEC as a coldwater trout fishery. Species typical of the Moose River can include blacknose dace, longnose dace, common shiner, cutlips minnow, brook trout, and white sucker (Georgia-Pacific 1983). In the 1970s, NYSDEC conducted a trout tagging survey, the results of which indicated a decline in the quality of the trout fishery in the Moose River. NYSDEC concluded that the presence of smallmouth bass, increased water temperatures, and low pH had adversely affected trout populations in the Moose River (Georgia-Pacific 1983).

The sport and recreational fishery in the Black River near Lyons Falls has been classified as moderately active (Georgia-Pacific 1983). Recreational fishing upstream of Carthage and throughout Lyons Falls has declined in recent years, likely as a result of diminished stocks of large walleye (Lowie et al. 1994). A 1992 angler survey conducted by NYSDEC indicates that angling trips had been reduced from 12 trips per acre to 7 trips per acre in the Lyons Falls area (Lowie et al. 1994).

Exhibit E

TABLE E.2-4

NUMBER AND RELATIVE PERCENT OF FISH CAPTURED IN THE BLACK RIVER BELOW LYONS FALLS MILL (BETWEEN LYONS FALLS AND CARTHAGE) AND ABOVE LYONS FALLS MILL (BETWEEN LYONS FALLS AND NORTH LAKE) (SOURCE: NYSDEC BUREAU OF FISHERIES 1993)

	Lyons Falls downstream to Carthage		rthage	Lyons Falls upstream to North Lake		
Species	Species	No. Captured	Relative %	Species	No. Captured	Relative %
1	Rock bass	34	11%	White sucker	61	18%
2	Walleye	29	10%	Rock bass	53	16%
3	White sucker	28	9%	Smallmouth bass	45	13%
4	Fallfish	26	9%	Brown trout	24	7%
5	Pumpkinseed	20	7%	Chain pickerel	24	7%
6	Yellow perch	19	6%	Pumpkinseed	16	5%
7	Brown bullhead	17	6%	Rainbow trout	12	4%
8	Smallmouth bass	17	6%	Northern hog sucker	12	4%
9	Tesselated darter	17	6%	Cutlips minnow	10	3%
10	Chain pickerel	16	5%	Common shiner	10	3%
11	Spottail shiner	12	4%	Brown bullhead	10	3%
12	Golden shiner	11	4%	Golden shiner	8	2%
13	Northern pike	8	3%	Margined madtom	8	2%
14	Satinfin shiner	8	3%	Brook trout	6	2%
15	Burboit	8	3%	Spottail shiner	6	2%
16	Northern hog sucker	7	2%	Tessellated darter	6	2%
17	Central mudminnow	6	2%	Yellow perch	6	2%
18	Grass pickerel	3	1%	Common carp	4	1%
19	Common carp	3	1%	Longnose dace	4	1%
20	Brown trout	1	<1%	Fantail darter	4	1%
21	Brook trout	1	<1%	Lake chub	2	1%
22	Common shiner	1	<1%	Fallfish	2	1%
23	E. silvery minnow	1	<1%	Creek chub	2	1%
24	Creek chub	1	<1%	Bluntnose minnow	2	1%
25	Bluntnose minnow	1	<1%	Blacknose dace	2	1%
26	Longnose dace	1	<1%	Slimy sculpin	NG	-

	Lyons Falls downstream to Carthage		Lyons Falls upstream to North Lake			
Species	Species	No. Captured	Relative %	Species	No. Captured	Relative %
27	Banded killifish	1	<1%	Redside dace	NG	-
28	Largemouth bass	1	<1%	Largemouth bass	NG	-
29	Fantail darter	1	<1%			
30	Hornyhead chub	NG	-			
31	Fathead minnow	NG	-			
32	Redside dace	NG	-			
33	Margined madtom	NG	-			
34	Logperch	NG	-			

The trout fishery in the Black River and the Moose River is supplemented through stocking efforts conducted by NYSDEC. Approximately 5,000 brook, brown, and rainbow trout are stocked annually in the Black River and Moose River near Lyonsdale (NYSDEC Bureau of Fisheries 2007). Stocked fish generally range in size between 7 and 13 inches.

Riverine habitat in the Black River below the Lyons Falls Dam consists primarily of uniform low-gradient flatwater and tailrace habitat (Photo Plate E.2-1). The 130-acre impoundment consists of shallow mixed lacustrine habitat that is primarily composed of a well-defined littoral zone (Photo Plate E.2-2). The maximum depth of the impoundment is approximately 17 feet near the intake. Substrates in the shallow impoundment are composed primarily of cobbles, boulder, bedrock, and sand.



Photo Plate E.2-1. Riverine habitat in the tailrace of Lyons Falls Mill.



Photo Plate E.2-2. Aquatic habitat in the Lyons Falls Mill impoundment just upstream of the Moose River confluence.

As part of the initial study implementation at the site, NBLF conducted an evaluation of aquatic habitat in Lyons Falls Mill tailrace. The results of the survey and additional information pertaining to existing aquatic habitat resources are discussed in greater detail below. Because Lyons Falls Mill is operated as a run-of-river facility, aquatic habitat in the tailrace is supported by river flows associated with natural precipitation events. To complete maintenance work at the site, flows are modified on a short-term and limited basis to allow for safe and timely completion of scheduled maintenance (e.g., replacement of flashboards).

Studies Conducted by NBLF

As described above, NBLF conducted select studies in support of the upgrades to Lyons Falls Mill proposed in 2006. Relevant studies related to fisheries resources are described below.

Baseline Fisheries Surveys

NBLF conducted a baseline fisheries survey in November of 2006. Daytime and nighttime boat electrofishing surveys were conducted within the tailrace and impoundment on November 8. To specifically target walleye, a popular game fish species, a nighttime boat electrofishing survey was conducted during the evening hours of November 9 in Lyons Falls Mill tailrace. Boat electrofishing surveys were focused on shoreline habitat along both the left and right bank below and above the Lyons Falls Dam, as well as along habitat associated with in-stream islands (Figure E.2-14).

In addition, two experimental mesh gill nets (mesh size: 0.5-inches to 2.5-inches) were deployed overnight in the tailrace area and impoundment for a period of 16 hours. Gill nets were set in the late afternoon on November 8 and 9 and pulled on each of the following mornings. Gill net locations are illustrated in Figure E.2-15. Beach seining was also conducted in shallow margins of the impoundment; however, the characteristics of the river channel above and below the dam (i.e., relatively steep banks and deep water) limited seining effectiveness and prevented the comprehensive use of this sampling method.





FIGURE E.2-15 LOCATION OF GILL NETS DURING BASELINE FISHERIES SURVEYS, LYONS FALLS MILL, NEW YORK, NOVEMBER 2006



The results of the fisheries survey indicate that fish species composition at Lyons Falls Mill is representative of the typical coolwater and coldwater communities known to occur in the Black River. Species composition is similar to that described in earlier studies conducted by NYSDEC and others in and around Lyons Falls. A total of 18 species represented by 197 fish were captured during the electrofishing surveys (Table E.2-5 and Table E.2-6). The dominant species at Lyons Falls Mill was chain pickerel (24%). Brown bullhead (14%), yellow perch (11%), golden shiner (9%), and pumpkinseed (9%) were also abundant. A single salmonid was observed during the survey: a brown trout captured from within the tailrace. No walleye of any age class were captured during day or nighttime boat electrofishing surveys, indicating limited use of waters associated with Lyons Falls Mill by this species. Variability in fish species composition was noticeable between daytime and nighttime sample events within the tailrace. Nighttime electrofishing resulted in the capture of 13 species (total catch = 44) while the day sample contained 10 species (total catch = 53). During the night sampling, chain pickerel again were the most common species, representing 25 percent of the sample.

The gill net catch was low. In the tailrace, one large adult walleye was captured in net C, below the plunge pool of Lyons Falls along the east bank, and one yellow perch was captured in net D, downstream of the mid-channel island (Figure E.2-15). The walleye measured 610 mm (24-inches) at a weight of 1,389 g (3 pounds).

TABLE E.2-5 FISH CAPTURED DURING DAYTIME AND NIGHTTIME BOAT ELECTROFISHING SURVEYS IN THE LYONS FALLS MILL TAILRACE, NOVEMBER 2006, LYONS FALLS, NEW YORK

Species	Abundance	Relative Percent
Chain Pickerel	26	27%
Brown Bullhead	13	13%
Rock Bass	13	13%
Yellow Perch	12	12%
Blacknose Dace	11	11%
White Sucker	5	5%
Pumpkinseed	4	4%
Smallmouth Bass	3	3%
Largemouth Bass	2	2%

Species	Abundance	Relative Percent
Northern Hog Sucker	2	2%
Banded Killifish	1	1.%
Black Crappie	1	1%
Brown Trout	1	1%
Burbot	1	1%
Fallfish	1	1%
Golden Shiner	1	1%
Total	97	-

* Tailrace information includes both the daytime and nighttime sample events

TABLE E.2-6

FISH CAPTURED DURING DAYTIME BOAT ELECTROFISHING SURVEY IN THE LYONS FALLS MILL IMPOUNDMENT, NOVEMBER 2006, LYONS FALLS, NEW YORK

Species	Abundance	Relative Percent
Chain Pickerel	21	21%
Golden Shiner	17	17%
Brown Bullhead	15	15%
Pumpkinseed	13	13%
Yellow Perch	10	10%
White Sucker	10	10%
Spottail Shiner	5	5%
Largemouth Bass	3	3%
Log Perch	2	2%
Smallmouth Bass	2	2%
Rock Bass	1	1%
Black Crappie	1	1%
Total	100	-





Tailrace Aquatic Habitat Survey

In support of the upgrades to Lyons Falls Mill proposed in 2006, NBLF developed a habitatbased study to assess existing spawning conditions for walleye and smallmouth bass. The goal of this study was to document existing spawning habitat conditions by evaluating depth, velocity, and substrate characteristics in the tailrace and comparing this information to known habitat preferences.

Preferred spawning conditions for both species are well documented. Spawning depth for walleye is typically less than 3 feet with preferred velocities ranging from 2.5 to 3.0 feet-persecond (fps) (McMahon et al. 1984; Smith 1985). Spawning and nest construction for smallmouth bass typically takes place in river shallows where average depth is approximately 3 feet or less (Edwards et al. 1983; Smith 1985). Optimal velocity for spawning and embryo development of smallmouth bass is typically less than 1.0 fps (Edwards et al. 1983; Smith 1985). Both species use gravel, cobble, and rubble substrates for spawning, although nest construction by smallmouth bass is typically in smaller gravels or in sandy substrates in well-protected eddies. Walleye typically use larger sized substrates to spawn (e.g., large gravel, cobble, and small boulders).

Cross-sections locations were selected in consultation with the NYSDEC on August 24, 2006. Cross-sections were established in areas that were representative of typical habitat in the tailrace. At each cross-section, information pertaining to the basic habitat requirements for spawning walleye and smallmouth bass (water depth, velocity, and dominant substrate type) was collected to provide an assessment of existing conditions. To aid in substrate analysis, cross-sections were established so that they included shoreline habitat beginning at the high water mark. Crosssection length ranged from 454 to 750 feet.

Along each transect, velocity, depth, and substrate data were collected at intervals of 5 to 10 feet. Velocity was measured in fps with a digital flowmeter at a depth of 1 foot below the surface. In deeper areas, water velocity was also measured at a depth of 3 feet. Depth was measured with a

sounding weight marked in 1-foot intervals. An underwater camera was used to characterize substrate composition.

Heavier precipitation in Lewis County during the fall of 2006 produced flooding conditions and higher river flow. Flow at the site ranged from approximately 3,225 to 3,875 cfs during sampling efforts (Figure E.2-17). Spillage over the dam occurred throughout the entire sampling effort (Photo Plate E.2-3). Because average monthly flow at Lyons Falls Mill in the spring months (March through May) is approximately 3,250 cfs, conditions during fall sampling were representative of typical conditions for walleye spawning, which occurs in the spring. Average discharge at Lyons Falls in June is approximately 1,300 cfs (USGS 2007); therefore, sampling conditions did not reflect ambient conditions that would be expected during smallmouth bass spawning (typically early summer).

FIGURE E.2-17

BLACK RIVER FLOW CONDITIONS DURING SAMPLING EFFORTS, LYONS FALLS, NEW YORK, NOVEMBER 2006 – BOONVILLE USGS GAGE, PRORATED TO LYONS FALLS. (CIRCLES INDICATE BEGINNING AND END OF SAMPLING EFFORTS)





Photo Plate E.2-3. River conditions during sampling in the Lyons Falls tailrace, November 2006.

Substrates - Sand is the dominant substrate in the tailrace (Figure E.2-18). There is a large depositional area directly in the center of the channel in the middle of the tailrace, which has resulted in the formation of a small sandy island. A large, low-velocity back eddy also occurs in the middle of the channel upstream of the island, which likely contributes to the deposition of sand at mid-channel. Along the east bank of the tailrace, cobbles and boulders are prominent (Figure E.2-18). Substrates are coarser (mixture of boulders and cobbles) towards the upstream portion of the tailrace, while finer sediment (sand) becomes dominant downstream of the falls. Areas of large woody debris accumulation are also prominent in the main channel. It is likely that some of this debris is remnant pieces of the original timber crib dam. Substrates in the small secondary tailrace channel to the west of the island are dominated by cobble and boulders.

Velocity - Water spilling over the falls splits into two distinct channels due to the presence of the mid-channel sandy island (Figure E.2-19). The largest volume of water funnels towards the east channel. There is also a significant counter current (upstream flow) along the eastern bank that

begins approximately 100 feet upstream of the existing canoe launch. A large area of low-velocity water occurs at the head of the mid-channel island. The maximum water velocity recorded at the time of sampling (November 2006) was 4.07 fps. The highest flow areas were along the eastern shore, where velocities were consistently above 1 to 2 fps (Figure E.2-19). Average and maximum water velocities per transect are presented in Table E.2-7.

Depth - The physical nature of the tailrace is that of an oversized pool and associated pool tail-out. The greatest depths are found immediately below the falls, with the plunge pool becoming shallower and more riverine in a downstream direction. During the survey, discharge over the falls was approximately 3,500 cfs, resulting in an average depth in the tailrace of 8.6 feet with a maximum of 27 feet (Table E.2-7; Figure E.2-20).

FIGURE E.2-18 DISTRIBUTION AND CLASSIFICATION OF SUBSTRATES IN THE TAILRACE OF LYONS FALLS MILL



FIGURE E.2-19 CHARACTERIZATION OF WATER VELOCITY IN THE TAILRACE OF LYONS FALLS MILL, NOVEMBER 2006


FIGURE E.2-20 CHARACTERIZATION OF WATER DEPTH IN THE TAILRACE OF LYONS FALLS MILL, NOVEMBER 2006



Location	Velocity (fps)		Depth (ft)	
-	Average	Maximum	Average	Maximum
XS 1	1.35	3.02	4.9	14.0
XS 2	1.24	2.72	5.9	14.0
XS 3	0.66	2.03	7.4	16.5
XS 4	0.72	2.72	11.6	20.0
XS 5	0.59	2.78	9.5	21.0
XS 6	0.49	4.07	12.2	27.0
Average (all XS's)	0.84	-	8.6	-
Maximum (all XS's)	4.07	-	27.0	-

TABLE E.2-7 SUMMARY OF DEPTH AND VELOCITY MEASUREMENTS TAKEN IN THE LYONS FALLS MILL TAILRACE, NOVEMBER 2006

In general, it appears from the habitat mapping survey that physical habitat for walleye and smallmouth bass spawning habitat exists in the tailrace. The primary section of usable habitat for spawning is likely the large cobble-boulder area on the east bank of the river opposite the area proposed for construction (XS 5 and XS 6). However, survey data from XS 5 and XS 6 indicate that the water depth over the cobble-boulder substrate during high flows drops off quickly so that the extent of any usable habitat is likely limited. Further, these two species comprised a relatively small percentage of the overall fish community (smallmouth bass -2.5%, walleye -0.5%), indicating that their prevalence in the tailrace is limited.

Benthic Macroinvertebrates

NBLF conducted a baseline survey of benthic macroinvertebrates pursuant to recommendations from the NYSDEC. The results of the assessment indicated that the overall benthic macroinvertebrate community is in excellent condition. See Section E.2.2, Report on Water Use and Quality, for details pertaining to the results of the benthic macroinvertebrate study.

Angler Use Survey

NBLF implemented an angler use survey in 2007 to assess fishing pressure and recreational fishing at the site. Use data were obtained daily at three sites at Lyons Falls Mill: the canoe

launch in the tailrace, the boat launch in the impoundment, and the Lyons Falls Picnic Area located upstream of the impoundment at the Lyons Falls Community Park. Throughout the study period (April 2, 2007 through October 16, 2007), a total of 413 anglers were observed in Lyons Falls Mill, either in the tailrace or in the impoundment. Average angler use at the site was 2.6 anglers per day. It appears from the results of this survey that both the tailrace and impoundment are fished regularly during the open water fishing season.

Existing and Proposed PM&E Measures

Existing fisheries data and studies conducted by NBLF indicate a robust coolwater/coldwater fish community upstream and downstream from Lyons Falls Dam. The fishery includes game fish such as walleye, bass, and brown trout and is popular with anglers. With the exception of a few individual pH measurements, all sampling events indicated that DO and pH met or exceeded New York State water quality standards for Class C and Class C(T) waters. The fisheries and water quality data indicate that current run-of-river operations support a healthy fishery at Lyons Falls Mill. As such, NBLF proposes to continue to operate the facility in a run-of-river mode so that outflow from the impoundment is consistent with inflow for the protection of aquatic resources.

The existing license for the Project does not require a continuous flow to be released from Lyons Falls Mill. In support of the redevelopment of Lyons Falls Mill, NBLF proposes to release seasonal minimum flows totaling 70 cfs downstream from the Lyons Falls Dam. Of the 70 cfs, a minimum of 45 cfs would be released annually from March 15 through November 30 to provide a fish movement continuity flow to facilitate the downstream movement of fish. A minimum flow of 25 cfs would also be released annually during the recreation season (May 1 through October 31) to provide a continuous flow over a portion of Lyons Falls for aesthetic purpose. NBLF will consult with resource agencies and other stakeholders to define the appropriate location(s) and mechanism(s) for the seasonal minimum flow releases.

Trashracks at Lyons Falls Mill currently have a clear-bar spacing of 1 7/8 inches. However, the buildup of frazil ice on the trashracks and in the penstocks during winter months has been an

ongoing operational concern at Lyons Falls Mill. Frazil ice buildup can significantly reduce flow through the trashracks and impact operations and generation. For this reason, the proposed new intake structure would utilize trashracks with a clear-bar spacing of three inches and bars angled 45-degrees to flow direction, with approach velocities no greater than 2 fps. NBLF proposes to install seasonal one-inch trashrack overlays on an annual basis. NBLF anticipates that the seasonal overlays would be installed as soon as possible following ice-out and removed in October. NBLF will consult with the NYSDEC, USFWS, and other parties to determine the specific schedule and notification requirements for the installation and removal of seasonal overlays.

Construction of the new Lyons Falls Mill will require temporary cofferdaming and a cessation of flow through the intake structure, penstocks, and existing generating units. During the construction period, NBLF will pass all flows over the spillway. Construction will also require excavation in the existing tailrace area to accommodate installation of the new units and draft tubes. The tailrace habitat study indicates that potential spawning habitat is located along the river right shoreline downstream from the Lyons Falls Mill Dam, opposite from the tailrace. Therefore, NBLF does not expect any impacts on potential spawning habitat as a result of temporary cofferdaming and excavation.

NBLF will prepare a Construction Soil Erosion and Sedimentation Control Plan and a Temporary Emergency Action Plan for FERC and NYSDEC approval following FERC's order amending the license and prior to the start of construction activities. Construction activities will comply with the terms of the existing Section 401 WQC issued for the Lyons Falls Project by NYSDEC on February 12, 1985, or any new 401 WQC issued by NYSDEC for this proposed amendment. NBLF will implement standard BMPs to address sediment and erosion control during construction and final stabilization in accordance with NYSDEC technical guidance.

Continued or Incremental Impacts on Fisheries

NBLF is not aware of any ongoing impacts on fisheries related to operation of Lyons Falls Mill, and the proposed redevelopment is not expected to have any continued or incremental impacts.

Information collected by NBLF indicates that fishery resources at Lyons Falls Mill have not been adversely affected by existing operations. Existing aquatic habitat, benthic macroinvertebrate communities, water quality (e.g., dissolved oxygen, water temperature, and pH), and the existing fish community composition provide evidence of a functional aquatic ecosystem. The fishery is popular with anglers and supports a number of game fish species.

NBLF proposes to provide a seasonal (March 15 – November 30) minimum fish movement continuity flow of 45 cfs downstream from the dam, operate the Development in a run-of-river mode, install seasonal trashrack overlays at the intakes, and release an additional 25 cfs for aesthetic purposes between May 1 and October 31, annually. The proposed upgrade would not significantly alter flow patterns at the site (i.e., all water diverted for power production would continue to be discharged into the tailrace).

Due to the small percentage of walleye and smallmouth bass observed in the tailrace during 2006 fisheries sampling, NBLF does not expect impacts to these managed species. The relatively low numbers of all life stages of these species indicate that they make up only a small percentage of the fish community at Lyons Falls. Further, results of the tailrace spawning habitat survey indicate that, although conditions for spawning (substrate, depth, and velocity) do exist for these two species, spawning habitat and substrate is limited in scope.

The most suitable spawning habitat for walleye and smallmouth bass is within the large cobbleboulder depositional zone just below the falls on the east side of the river. This area would not be impacted by construction activities associated with the proposed upgrade.

Any potential impacts to turbidity and sediment mobilization would be short-term and occur only during construction-related activities. Measures to prevent erosion and sediment mobilization would be implemented in accordance with NYSDEC technical guidelines and in accordance with articles pursuant to a modified WQC.

E.2.4 Report on Terrestrial Wildlife

The proposed redevelopment of Lyons Falls Mill would take place entirely within the footprint of the former Georgia-Pacific paper mill located along river left. The grounds of the paper mill are characterized by industrial buildings and structures in various states of disrepair. The remnant facilities associated with the mill do not offer substantive or quality upland terrestrial habitat, and the area is considered an industrial site.

Lands surrounding Lyons Falls Mill provide a variety of upland habitats that are utilized by numerous species of mammals, birds, and amphibians typical of the northeastern United States (Georgia-Pacific 1983). Wildlife and associated habitat are reported as stable⁸. Wetland and riparian habitat is limited in extent due in part to the geographic nature of area, which consists of exposed bedrock and steep slopes. Wildlife resources observed or with the potential to exist in the vicinity of Lyons Falls Mill are discussed below.

Mammals

A number of the mammals that may occur within the vicinity of Lyons Falls Mill are associated with semi-open woods that are often interspersed with development. The most common of these include raccoon, red fox, striped skunk, cottontail rabbit, chipmunk, opossum, and the New England cottontail rabbit (Georgia-Pacific 1983; Degraaf 2001). Small mammal surveys conducted by Brookfield Renewable Energy Group for hydroelectric projects located downstream of Lyons Falls Mill indicate that white-footed mice, short-tailed shrews, voles, and chipmunks are also common in the Black River Valley (Erie Boulevard 2006).

Other mammal species that may occur at Lyons Falls Mill include beaver, muskrat, white-tailed deer, coyote, grey fox, and river otter. A number of bat species also have the potential to occur, including the Indiana bat, northern long-eared bat, silver-haired bat, big brown bat, red bat, and the hoary bat (Degraaf 2001).

⁸ Personal communication, Bill Gordon, NYSDEC, Regional Wildlife Biologist, April 2006.

Birds

The NYSDEC reports that 79 avian species potentially breed in the vicinity of Lyons Falls Mill (NYSDEC Bureau of Wildlife 2006). Of those, 38 are confirmed, 4 are probable, and 37 are possible. A number of different taxonomic groups are reported in the vicinity of Lyons Falls Mill including wading birds, shorebirds, songbirds, hawks, raptors, and waterfowl. Annual Audubon Christmas bird counts in the region are tabulated from sightings in Watertown and Rome, New York, both of which are approximately 35 miles from Lyons Falls Mill. During 2005, 40 bird species were reported from Rome and 47 species were reported from Watertown. Species observations were comprised of various taxa including raptors, waterfowl, songbirds, and game birds (Audubon 2006).

Common perching birds including veery, yellow-rumped warbler, American robin, and blackcapped chickadee were reported at Lyons Falls Mill as part of studies conducted in the 1980s in support of relicensing the Project (Georgia-Pacific 1983). Because forested upland habitat is common, lands adjacent to Lyons Falls Mill likely support numerous other species of song and perching birds. According to Georgia-Pacific, waterfowl use was limited by a lack of emergent cover as well as rapidly moving water. Habitat for waterfowl is limited to smaller pools located along portions of the Moose River, which provide resting areas for migrating waterfowl (Georgia-Pacific 1983). Similarly, the area proposed for the new powerhouse is characterized by industrial development, a lack of vegetative cover, and fast-flowing water, making the site generally unsuitable for waterfowl use.

Reptiles and Amphibians

Reptile and amphibian species with the potential to occur in the vicinity of Lyons Falls Mill are based on the known ranges of common and uncommon species. Species with the potential to occur include the Jefferson salamander, blue spotted salamander, spotted salamander, eastern newt, eastern red-backed salamander, dusky salamander, mountain dusky salamander, northern two-lined salamander, and mudpuppy (Behler and King 1991). Frog species that may occur include the American bullfrog, green frog, pickerel frog, northern leopard frog, mink frog, wood frog, gray tree frog, Cope's grey tree frog, spring peeper, and the American toad (Behler and King 1991). Habitat requirements vary for those species highly dependent on aquatic habitat such as the mink frog (Behler and King 1991) to those such as the wood frog, which require forested uplands (Degraaf 2001).

Reptiles that may occur include common northern New York species including the snapping turtle, painted turtle, spotted turtle, and wood turtle (Behler and King 1991). Snakes that may occur include the milk snake, common garter snake, northern water snake, and eastern ringneck (Behler and King 1991).

Studies Conducted by NBLF

There were no study recommendations related to terrestrial wildlife resources submitted by the resource agencies or other interested parties in support of the upgrade proposed in 2006. Therefore, NBLF did not perform any terrestrial wildlife resources studies at that time. NBLF believes that existing information is sufficient to characterize terrestrial wildlife resources in the vicinity of Lyons Falls Mill and that no additional studies are warranted in support of the proposed redevelopment. Studies related to rare, threated, and endangered species are discussed in Section E.2.6, below.

Existing and Proposed PM&E Measures

The existing license does not include specific PM&E measures related to terrestrial wildlife resources. Proposed redevelopment of Lyons Falls Mill would take place within the footprint of the former Georgia-Pacific paper mill located along river left. The paper mill is characterized as an abandoned industrial site that includes standing and collapsed buildings, concrete and asphalt roadways, manufacturing equipment, and storage tanks. There is no significant or high-quality terrestrial habitat within the footprint of the former paper mill. NBLF believes that limiting construction to the footprint of the paper mill is an effective measure to avoid construction-related impacts on terrestrial wildlife habitat.

Lyons Falls Mill currently operates in a run-of-river mode. NBLF proposes to continue run-ofriver operations following redevelopment. Continued run-of-river operations are expected to maintain existing shoreline habitat for terrestrial species.

NBLF will prepare a Construction Soil Erosion and Sedimentation Control Plan and a Temporary Emergency Action Plan for FERC and NYSDEC approval following FERC's order amending the license and prior to the start of construction activities. Construction activities will comply with the terms of the existing Section 401 WQC issued for the Lyons Falls Project by NYSDEC on February 12, 1985, or any new 401 WQC issued by NYSDEC for this proposed amendment. NBLF will implement standard BMPs to address sediment and erosion control during construction and final stabilization in accordance with NYSDEC technical guidance.

Continued or Incremental Impacts on Terrestrial Wildlife

NBLF is not aware of any ongoing impacts on terrestrial wildlife related to operation of Lyons Falls Mill, and the proposed redevelopment is not expected to have any continued or incremental impacts on these resources. Construction activities associated with the proposed redevelopment of Lyons Falls Mill would take place entirely within the footprint of the existing paper mill located on river left. The area is currently characterized by remnants of industrial buildings and structures associated with the mill in various states of disrepair. Given the industrial nature of the site, lack of existing vegetation, and absence of cover, the proposed construction footprint does not offer substantive wildlife habitat.

As noted above, NBLF proposes to continue run-of-river operations at Lyons Falls Mill. NBLF expects that run-of-river operations will continue to maintain existing terrestrial habitats along the impoundment and upstream reach of the Moose and Black rivers.

Measures to prevent erosion and sediment mobilization would be implemented in accordance with NYSDEC technical guidelines and in accordance with articles pursuant to a modified WQC. NBLF will follow BMPs and appropriate technical guidance for shoreline stabilization and revegetation (as appropriate) related to construction of the new facilities.

E.2.5 Report on Botanical Resources

The proposed redevelopment of Lyons Falls Mill would take place entirely within the footprint of the former Georgia-Pacific paper mill located along river left. The mill is considered an industrial site and does not support substantive or quality botanical resources. The following information describes botanical resources within the vicinity of Lyons Falls Mill.

Upland Habitats

The forests within north central New York, and those within the vicinity of Lyons Falls Mill, are considered to be transitional, represented by a mix of coniferous species from the north and broadleaf deciduous species from the south (Benyus 1989). Forest cover types include stands of coniferous evergreens, deciduous broadleaf trees, and mixed stands that are interspersed with shrub-sapling edge habitat, especially in recently disturbed areas. The most prominent stands are a mix of white pine, yellow birch, eastern hemlock, black cherry, red maple, sugar maple, and northern white cedar (Georgia-Pacific 1983). These stands are dominated by sugar maple, beech, and yellow birch (Degraaf 2001). Sub-dominant stands include white pine and hemlock, which are typically found in areas located along steeper portions of the riverbank. The understory consists of common ferns, trillium, and gold thread (Georgia-Pacific 1983). Predominant edge and understory sapling species include striped maple and witch hazel (Georgia-Pacific 1983). Riparian vegetation within areas adjacent to wetlands along the Moose River includes white pine, American beech, red oak, white birch, eastern hemlock, and bracken fern.

Outside of the industrial mill compound on the west bank of the Black River, the dominant tree species are oak, maple, sumac, and ash. This bank contains a flood plain terrace and a much more gradual slope than the eastern side of the river.

Riparian Habitat

The development of shoreline vegetation is limited near Lyons Falls by shallow bedrock soils, exposed bedrock, boulder, and sandy areas. Shoreline areas that do support vegetation contain shrub species including speckled alder, low-bush blueberry, and honeysuckle. The majority of these areas are inundated during periods of high water (Georgia-Pacific 1983). Riparian vegetation below the dam includes red oak, hemlock, witch hazel, bigtooth aspen, white pine, and Scotch pine.

Wetland Habitat

In January 2015, NBLF conducted a review of the USFWS's National Wetland Inventory (NWI) and the NYSDEC's GIS wetland maps database. The results of this study are summarized in the following section.

Studies conducted by NBLF

NBLF performed a review of the NYSDEC GIS wetlands database and NWI maps prepared by the USFWS. The NYSDEC's GIS database did not identify any wetlands within the vicinity of Lyons Falls Mill. Based on a review of the NWI data, six classes of wetlands have been mapped near Lyons Falls. These wetlands are presented in Figure E.2-21. A description of the wetlands and their classification according to Cowardin et al. 1979 is presented in Table E.2-8.



FIGURE E.2-21 NWI-MAPPED WETLANDS IN THE VICINITY OF LYONS FALLS MILL

TABLE E-2.8			
NWI-MAPPED WETLANDS IN THE VICINITY OF LYONS FALLS MILL			

Wetlands Code	System	Class	Wetland Type	Cowardin	General Description
PEM1E	Palustrine	Emergent	Freshwater Emergent wetland	Palustrine emergent	Herbaceous march, fen, swale and wet meadow. Seasonally Flooded / Saturated
PFO1E	Palustrine	Forested	Freshwater- Forested and Shrub wetland	Palustrine forested and/or Palustrine shrub	Forested swamp or wetland shrub bog or wetland. Seasonally Flooded
PUBHh	Palustrine	Unconsolidated Bottom	Freshwater Pond	Palustrine unconsolidated bottom, Palustrine aquatic bed	Pond / Diked or Impounded
PUBHx	Palustrine	Unconsolidated Bottom	Freshwater Pond	Palustrine unconsolidated bottom, Palustrine aquatic bed	Pond / Excavated

Wetlands Code	System	Class	Wetland Type	Cowardin	General Description
R3RBH	Riverine	Rock Bottom	Riverine	Riverine wetland and deep water	River or stream channel / Permanently Flooded
R3UBH	Riverine	Unconsolidated Bottom	Riverine	Riverine wetland and deep water	River or stream channel / Permanently Flooded

Existing and Proposed PM&E Measures

The existing license does not include specific PM&E measures related to botanical resources. Proposed redevelopment of Lyons Falls Mill would take place within the footprint of the former Georgia-Pacific paper mill located along river left. The paper mill is characterized as an abandoned industrial site that includes standing and collapsed buildings, concrete and asphalt roadways, manufacturing equipment, and storage tanks. There is no significant or high-quality upland, riparian, or wetland habitat or botanical resources within the footprint of the former paper mill. NBLF believes that limiting construction to the footprint of the paper mill is an effective measure to avoid construction-related impacts on botanical resources.

Lyons Falls Mill currently operates in a run-of-river mode. NBLF proposes to continue run-of-river operations following redevelopment. Continued run-of-river operations are expected to maintain existing distribution of botanical resources in upland, shoreline, and wetland habitats.

NBLF will prepare a Construction Soil Erosion and Sedimentation Control Plan and a Temporary Emergency Action Plan for FERC and NYSDEC approval following FERC's order amending the license and prior to the start of construction activities. Construction activities will comply with the terms of the existing Section 401 WQC issued for the Lyons Falls Project by NYSDEC on February 12, 1985, or any new 401 WQC issued by NYSDEC for this proposed amendment. NBLF will implement standard BMPs to address sediment and erosion control during construction and final stabilization in accordance with NYSDEC technical guidance.

Continued or Incremental Impacts on Botanical Resources

NBLF is not aware of any ongoing impacts on botanical resources related to operation of Lyons Falls Mill, and the proposed redevelopment is not expected to have any continued or incremental impacts on these resources. Construction activities associated with the proposed redevelopment of Lyons Falls Mill would take place entirely within the footprint of the existing paper mill located on river left. The area is currently characterized by remnants of industrial buildings and structures associated with the mill in various states of disrepair. Given the industrial nature of the site, there is a general lack of botanical resources within the proposed construction footprint.

As noted above, NBLF proposes to continue run-of-river operations at Lyons Falls Mill. NBLF expects that run-of-river operations will continue to maintain existing upland, riparian, and wetland habitat along the impoundment and upstream reaches of the Moose and Black rivers.

Any potential shoreline impacts would be related to the construction footprint. Measures to prevent erosion and sediment mobilization would be implemented in accordance with NYSDEC technical guidelines and in accordance with articles pursuant to a modified WQC. NBLF will follow BMPs and appropriate technical guidance for shoreline stabilization and revegetation (as appropriate) related to construction of the new facilities.

E.2.6 Report on Threatened and Endangered Species

Federally Listed Species

In January 2015, NBLF consulted with the USFWS to identify threatened and endangered species or critical habitat that may occur within the vicinity of Lyons Falls Mill. By letter dated January 17, 2015, the USFWS identified one endangered species and one proposed endangered species that may be present. These species are presented in Table E.2-9. There is no critical habitat within the vicinity of Lyons Falls Mill.

TABLE E.2-9 FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES THAT MAY OCCUR WITHIN THE VICINITY OF LYONS FALLS MILL

Species	Status
Indiana bat	Endangered
Northern long-eared bat	Proposed endangered

Consultation correspondence with the USFWS is presented in Appendix D to this Initial Consultation/Amendment Package.

State-Listed Species

The NYSDEC lists nineteen species of fish, two species of amphibians, twenty species of birds, eleven species of mammals, twelve species of reptiles, and fifteen species of insects as either threatened or endangered in New York (NYSDEC Endangered Species Program 2015). In support of the upgrades to Lyons Falls Mill proposed in 2006, NBLF consulted with the New York Natural Heritage Program (NYNHP) to identify state-listed species within the vicinity of Lyons Falls Mill:

The NYNHP report indicated that two state-listed species may occur in or around Lyons Falls: the loggerhead shrike and slender marsh bluegrass. The state-listed Tomah mayfly has also been observed in the Black River in the Lowville area, approximately 24 miles downstream of Lyons Falls. The NYNHP did not identify any additional state-listed threatened or endangered species that may occur within the vicinity of Lyons Falls Mill during the 2006 amendment proceeding.

By letter dated January 23, 2015, NBLF reinitiated consultation with the NYNHP to identify information regarding the following within the vicinity of Lyons Falls:

- State-listed threatened or endangered species;
- Species proposed for listing as threatened or endangered, or species of concern;
- Designated and proposed critical habitat; and
- Candidate species.

Consultation correspondence is presented in Appendix D of this Initial Consultation/Amendment Package.

Studies Conducted by NBLF

NBLF will continue to consult with the NYNHP and USFWS to identify any threatened or endangered species that may occur within the vicinity of Lyons Falls Mill. NBLF believes that such information will be sufficient to characterize threatened and endangered species and that no additional studies are warranted in support of the proposed redevelopment.

Existing and Proposed PM&E Measures

The existing license does not include specific PM&E measures related to threatened and endangered species. Proposed redevelopment of Lyons Falls Mill would take place within the footprint of the former Georgia-Pacific paper mill located along river left. The paper mill is characterized as an abandoned industrial site that includes standing and collapsed buildings, concrete and asphalt roadways, manufacturing equipment, and storage tanks. There is no significant or high-quality habitat within the footprint of the former paper mill. NBLF believes that limiting construction to the footprint of the paper mill is an effective measure to avoid construction-related impacts on threatened or endangered species, should any be present.

Both the Indiana bat and northern long-eared bat have been identified by the USFWS as potentially occurring within the vicinity of Lyons Falls Mill. Although NBLF does not anticipate any impacts on the Indiana bat or northern long-eared bat as a result of redevelopment or operations, NBLF will prepare management plans for both species in accordance with guidance from the USFWS. NBLF will prepare an Indiana Bat and Northern Long-eared Bat Management Plan for USFWS approval following FERC's order amending the license and prior to the start of construction activities.

Lyons Falls Mill currently operates in a run-of-river mode. NBLF proposes to continue run-of-river operations following redevelopment. Continued run-of-river operations are expected to

maintain existing upland, riparian, open-water, and wetland habitat to support the loggerhead shrike, Indiana bat, northern long-eared bat, slender marsh bluegrass, and Tomah mayfly.

NBLF will prepare a Construction Soil Erosion and Sedimentation Control Plan and a Temporary Emergency Action Plan for FERC and NYSDEC approval following FERC's order amending the license and prior to the start of construction activities. Construction activities will comply with the terms of the existing Section 401 WQC issued for the Lyons Falls Project by NYSDEC on February 12, 1985, or any new 401 WQC issued by NYSDEC for this proposed amendment. NBLF will implement standard BMPs to address sediment and erosion control during construction and final stabilization in accordance with NYSDEC technical guidance.

Continued or Incremental Impacts on Threatened and Endangered Species

NBLF is not aware of any ongoing impacts on threatened or endangered species related to operation of Lyons Falls Mill, and the proposed redevelopment is not expected to have any continued or incremental impacts on these resources. Construction activities associated with the proposed redevelopment of Lyons Falls Mill would take place entirely within the footprint of the existing paper mill located on river left. The area is currently characterized as remnants of industrial buildings and structures associated with the mill in various states of disrepair. Given the industrial nature of the site, lack of existing vegetation, and absence of cover, the proposed construction footprint does not offer significant or high-quality habitat.

As noted above, NBLF proposes to continue run-of-river operations at Lyons Falls Mill. NBLF expects that run-of-river operations will continue to maintain existing riparian, upland, wetland, and open-water habitat along the impoundment and upstream reach of the Moose and Black rivers.

Any potential shoreline impacts would be related to the construction footprint. Measures to prevent erosion and sediment mobilization would be implemented in accordance with NYSDEC technical guidelines and in accordance with articles pursuant to a modified WQC. NBLF will

follow BMPs and appropriate technical guidance for shoreline stabilization and revegetation (as appropriate) related to construction of the new facilities.

E.2.7 Report on Recreation Resources

The Moose and Black Rivers provide many opportunities for outdoor recreation including canoeing, kayaking, angling, sightseeing, whitewater boating, and picnicking (FERC 1986; Erie Boulevard 2006). In this section, recreational resources in the vicinity of Lyons Falls Mill are primarily discussed on a regional scale.

Water-Based Recreational Activities

The Black River is primarily flat in the vicinity of Lyons Falls Mill and, therefore, appropriate for both motorized and non-motorized boating. Public boat access is provided at five launch sites along the surrounding reach of the Black River, generally at intervals of 4 to 11 miles (NYSDEC 2007a). The Lewis County segment of the river near Lyons Falls Mill is primarily flat, with an average gradient of 0.3 feet per mile. This section of the river is popular for canoeing and recreational kayaking, motor boating, and fishing.

Due to the hydrologic nature of the Moose River in the vicinity of Lyons Falls Mill, only nonmotorized boating, canoeing, and kayaking occur. The "Bottom Moose River," between the town of Fowlersville and the Gouldtown impoundment has an average gradient of 72 feet-permile with 12 major identified rapids over the course of a 3.6 mile segment (American Whitewater 2006; FERC 1986). The Bottom Moose River is also the location for the Moose River Festival, a three-day annual event in mid-October that draws hundreds of whitewater paddlers and numerous spectators to the area.

Angling is also a popular recreational activity along the Black and Moose Rivers. Angling along the Black River near Lyons Falls Mill is primarily for brook, brown, and rainbow trout, smallmouth bass, chain pickerel, northern pike, rock bass, and walleye (NYSDEC 2005a). Fishing on the Moose River is primarily for trout, bass, pike, and pan fish (NYSDEC 2005a).

NBLF currently provides recreational access both upstream (impoundment) and downstream (tailrace) of Lyons Falls Mill to support such activities. Recreational facilities at Lyons Falls Mill are discussed in additional detail below.

The Moose and Black Rivers are designated under the New York State Wild, Scenic, and Recreational Rivers Act. Sections of both the Moose River and the Black River are identified as "scenic" for the state of New York. Approximately 15 miles of the Moose River, from the confluence of the South and Middle Branches to the boundary of Adirondack State Park, is designated a scenic waterway. The Black River is designated as scenic from the point where Farr Road crosses the river (approximately 8 miles upstream of Lyons Falls Mill) to the point where the river intersects the Adirondack Park boundary (NYSDEC 2005b). None of these sections are within the Lyons Falls Project boundary. The Black River was also designated as a Blueway Trail by the New York Department of State (NYDS) and Governor George Pataki in June 2005.

Land-Based Recreational Activities

Lewis County provides many opportunities for outdoor recreation. Opportunities for hiking, picnicking, sightseeing, biking, and other activities are provided by several state, county, and municipal parks, historic sites, and trails. Parks located near Lyons Falls Mill include Whetstone Gulf State Park, Singing Waters Picnic Area, and Whittaker Falls Park. Whetstone Gulf State Park is located on the eastern edge of the Tug Hill Plateau, approximately nine miles northwest of Lyons Falls Mill. The park offers a beach, camping, hunting, picnic tables, fishing access to Whetstone Creek, and miles of trails for hiking and cross-county skiing (New York State Parks 2007). Singing Waters Picnic Area is owned and operated by Lewis County and provides picnic facilities, sightseeing opportunities, and primitive camping located approximately four miles northeast of Lyons Falls Mill (Adirondack Regional Tourism Council 2006). Whittaker Falls Park, managed by the Town of Martinsburg, provides campsites, picnic facilities, swimming area, restrooms with showers, and two pavilions. The park is located approximately 10 miles northwest of Lyons Falls Mill (Adirondack Regional Tourism Council 2006).

More than 175,000 acres of public land in Lewis County is available for hunting, hiking, and fishing (Adirondack Regional Tourism Council 2006). Much of the public land in Lewis County is state forest land that is administered by the NYSDEC and the Bureau of State Land Management. State forests within close proximity to Lyons Falls include Otter Creek, Beartown, High Towers, and Lesser Wilderness. The Tug Hill Wildlife Management Area provides hiking, cross-country skiing and snowshoeing trails, bird watching opportunities, camping, hunting and trapping, and angling opportunities on 5,114 acres west of Lyons Falls Mill (NYSDEC 2007d).

Recreational Facilities Associated with Lyons Falls Mill

Existing recreational facilities at Lyons Falls Mill include boat access and portage opportunities, fishing, picnicking, walking, and sightseeing along the Moose and Black Rivers (Figure E.2-22). Many of these sites have been improved over recent years by NBLF and previous owners as a means to provide recreational opportunities for local communities. An improved canoe/kayak access site downstream of the dam (Photo Plate E.2-4 and Photo Plate E.2-5) provides parking, a hand-carry boat launch, and angling access to the eastern shoreline of the Black River. NBLF also provides access to the impoundment with a gravel vehicle-access boat launch located just upstream of the confluence of the Black and Moose Rivers (Photo Plate E.2-6), located off of River Road. There is a carry-in boat access area on the Black River provided by NBLF, located approximately 1.5 miles upstream of the dam (FERC 1986).

In addition to these recreation sites, public access to Project lands is permitted. As such, informal recreation activities such as hunting, angling, hiking and cross-country skiing occur at Lyons Falls Mill (FERC 1986). There is also an informal recreation access point and vehicle pull-out on the east side of Black River, just downstream of the dam, which allows local residents to access Lyons Falls directly.

Just upstream of Lyons Falls Dam on the Moose River is a canoe/kayak access site that provides portage opportunities around the Lyons Falls Dam. The upstream canoe access is connected to a downstream canoe/kayak access site via Lyons Falls Road.

The Lyons Falls Community Park, which was donated by the former licensee, Georgia-Pacific, to the Village of Lyons Falls, is located adjacent to Lyons Falls Mill on the Black River,

upstream of the confluence with the Moose River (Figure E.2-22). The Park provides sports fields, a skating rink, and picnic facilities. This site is not within the Project boundary and is managed by the Village of Lyons Falls.

FIGURE E.2-22 RECREATIONAL SITES ASSOCIATED WITH LYONS FALLS MILL, VILLAGE OF LYONS FALLS, NEW YORK





Photo Plate E.2-4. Canoe and kayak access parking area to the Black River below the Lyons Falls.



Photo Plate E.2-5. Canoe and kayak access parking area to the Black River below Lyons Falls.



Photo Plate E.2-6. Boat launch, picnic area, and fishing opportunities provided by NBLF at the Black River / Moose River confluence.

Recreation facilities on NBLF-owned property are managed and maintained by NBLF. However, fishing and hunting regulations and enforcement on these facilities are the responsibility of the NYSDEC. With respect to fishing, NYSDEC regulates fishing methods and devices, creel limits, selling and importing species, licensing and enforcement throughout New York (NYSDEC 2007b). Specific to Lyons Falls Mill, there are special black bass limits on the Black River and special trout regulations on both the Moose and Black Rivers (NYSDEC 2007d).

The NYSDEC also regulates hunting, including waterfowl hunting, that may occur at Lyons Falls Mill. The NYSDEC regulates hunting methods and bag limits, licensing and enforcement, and sets allowable seasons for each species (NYSDEC 2007e).

Studies Conducted by NBLF

In support of the upgrades proposed in 2006, NBLF conducted a recreational use survey throughout the 2007 recreation season to assess overall recreation use at the site, including angler

use. Recreational facilities at Lyons Falls Mill were monitored by NBLF staff between May 6, 2007 and October 16, 2007. Monitoring was conducted on 147 of 164 days within the study period (90 percent) and included four peak holidays: Memorial Day, Independence Day, Labor Day, and Columbus Day. For this study, data was collected from the Lyons Falls Boat Access (impoundment), Lyons Falls Canoe Access (downstream), and the Lyons Falls Picnic Area.

Data was grouped by day type (weekdays, weekend days, and holidays) to allow a better understanding of how recreation sites are used by the public. Missing days were represented using mean replacement within each day type and activity (boating, fishing, etc.) for the 17 days that were not monitored. Daily totals were then computed and summed by day type, and seasonal use estimates were computed by summing the resulting totals.

Peak weekend averages were developed by dividing the total estimated holiday use estimates by the number of holiday weekends in the season.

Table E.2-10 presents the estimated recreation use at Lyons Falls Mill by day type. Table E.2-11 presents estimated total daytime and nighttime use and peak weekend averages.

ESTIMATED 2007 RECREATION USE BI DAT THE AT LIONS FALLS WILL			
Day Type	Activity	Days	
Weekdays	boating	51	
	fishing	227	
	swimming	105	
	sightseeing	176	
	picnicking	18	
	Other	51	
	Undetermined	24	
	Subtotal	652	
Weekends	boating	16	
	fishing	188	
	swimming	41	
	sightseeing	145	
	picnicking	12	

TABLE E.2-10 FSTIMATED 2007 RECREATION USE BY DAY TYPE AT LYONS FALLS MILL

Day Type	Activity	Days
	Other	8
	Undetermined	0
	Subtotal	410
Holida ys	boating	12
	fishing	32
	swimming	8
	sightseeing	38
	picnicking	5
	Other	0
	Undetermined	0
	Subtotal	95
Total		1,157

TABLE E.2-11 ESTIMATED 2007 DAYTIME, NIGHTTIME AND PEAK WEEKEND AVERAGES AT LYONS FALLS MILL

	Annual Total	Peak Weekend Average
Daytime	1,157	24
Nighttime	0	0

Existing and Proposed PM&E Measures

Proposed redevelopment of Lyons Falls Mill would take place within the footprint of the former Georgia-Pacific paper mill located along river left. The paper mill is characterized as an abandoned industrial site that includes standing and collapsed buildings, concrete and asphalt roadways, manufacturing equipment, and storage tanks. There are no recreation facilities within the boundaries of the former paper mill, and none of the existing recreational facilities at Lyons Falls Mill would be impacted by the proposed redevelopment. NBLF believes that limiting construction to the footprint of the paper mill is an effective measure to avoid construction-related impacts on recreation resources.

NBLF proposes to continue the operation and maintenance of existing recreational facilities at Lyons Falls Mill. NBLF proposes to install seasonal 1-inch clear-bar-spacing trashrack overlays on an annual basis. NBLF anticipates that the seasonal overlays would be installed as soon as possible following ice-out and removed in October. Further, NBLF proposes to release a minimum 45 cfs fish movement flow between March 15 and November 30 annually for the protection of fish and aquatic resources. The proposed seasonal trashrack overlays and fish movement flow will continue to support a productive downstream sport fishery that includes popular game fish such as largemouth and smallmouth bass, rainbow trout, brown trout, chain pickerel, northern pike, rock bass, and walleye.

The recreation study conducted in 2007 indicates that one of the largest groups of users attracted to Lyons Falls during the recreational season are described as "sightseers." There are currently no minimum flow requirements at Lyons Falls Mill, and aesthetic flows over Lyons Falls only occur when the hydraulic capacity of the existing units is exceeded. NBLF proposes to provide a seasonal minimum aesthetic flow of 25 cfs over Lyons Falls for the duration of the recreational season (May 1 – October 31). The seasonal minimum aesthetic flow will enhance the aesthetics of the falls during the recreation season. NBLF will consult with the Town of Lyons Falls, NYSDEC, USFWS, Lewis County, and other parties to determine the appropriate location and mechanism for the seasonal minimum aesthetic flow release.

Any impact to recreation as a result of construction activities is expected to be temporary and limited. NBLF will prepare a Construction Soil Erosion and Sedimentation Control Plan and a Temporary Emergency Action Plan for FERC and NYSDEC approval following FERC's order amending the license and prior to the start of construction activities. Construction activities will comply with the terms of the existing Section 401 WQC issued for the Lyons Falls Project by NYSDEC on February 12, 1985, or any new 401 WQC issued by NYSDEC for this proposed amendment. NBLF will implement standard BMPs to address sediment and erosion control during construction and final stabilization in accordance with NYSDEC technical guidance.

Continued or Incremental Impacts on Recreation Resources

NBLF is not aware of any ongoing impacts on recreation resources related to operation of Lyons Falls Mill, and the proposed redevelopment is not expected to have any continued or incremental impacts on these resources. Construction activities associated with the proposed redevelopment of Lyons Falls Mill would take place entirely within the footprint of the existing paper mill located on river left. The area is currently characterized by the remnants of industrial buildings and structures associated with the mill. Given the industrial nature of the site, the proposed construction footprint does not offer any recreational access or facilities.

As noted above, NBLF proposes several PM&E measures to support or enhance recreation at Lyons Falls Mill, including:

- Seasonal installation of trashrack overlays with 1-inch clear-bar spacings, installed as soon as possible following ice-out and removed in October.
- A seasonal (March 15 November 30, annually) minimum fish movement flow of 45 cfs released downstream from Lyons Falls Dam to enhance and protect fish and aquatic resources, including game fish.
- Continued operation and maintenance of existing recreational facilities at Lyons Falls Mill.
- A seasonal (May 1 October 31, annually) 25 cfs minimum aesthetic flow released over Lyons Falls to enhance the aesthetics of the falls during the recreation season.
- Preparation and implementation of a Construction Soil Erosion and Sedimentation Control Plan and a Temporary Emergency Action Plan to avoid temporary impacts on instream recreation.
- Continued run-of-river operations.

NBLF expects that these PM&E measures will enhance and protect recreational opportunities at Lyons Falls Mill. Therefore, NBLF does not anticipate any continued or incremental impacts on recreation as a result of the proposed redevelopment.

E.2.8 Report on Cultural and Historic Resources

Four major cultural stages or periods define precontact developments in the northern portion of New York State:

- Paleoindian period c. 10,500 B.C. to 8,000 B.C.
- Archaic period c. 8,000 B.C. to 1,500 B.C.
- Transitional period c. 1,500 B.C. to 1,000 B.C.
- Woodland period c. 1000 B.C. to 1615 A.D.

The Paleoindian period begins in the terminal Pleistocene at the end of the Wisconsinan glaciation. The late glacial and early Holocene transition presented a dynamic mosaic of changing environmental settings. Glacial retreat created rapid, unpredictable, and extreme changes in climate, drainage, topography, and soils. Paleoindian subsistence practices relied on a hunting and gathering strategy that depended heavily on large migratory game. The mobility and settlement patterns of Paleoindian groups appears linked with seasonal migratory routes, landscape features, and the availability of high-quality lithic raw materials. Paleoindian sites in the Northeast and New York State typically consist of a sparse lithic assemblage that includes fluted projectile points, end scrapers, gravers, and blades. No Paleoindian artifacts have been found in the immediate vicinity of Lyons Falls, but have been found approximately 35 miles to the northwest on the east side of the Black River.

The Archaic period represents a period of gradual transition. The final retreat of the glaciers at the end of the Pleistocene resulted in warmer and drier conditions that supported a more temperate, mixed deciduous-coniferous forest and essentially modern fauna. The archaeological record from the Archaic period suggests an increasing cultural diversity and elaboration. Sites from this period include seasonal base camps and special purpose loci used for hunting, fishing, gathering, food processing, and raw material. Overall, the Archaic period is viewed as a period of population growth and expansion.

Some archaeologists recognize a transitional period between the Archaic and later Woodland period. The Transitional stage is marked by the gradual introduction of pottery. The Woodland period is characterized by the emergence of ceramic vessels, incipient horticulture, semi-

permanent settlements, and the development of complex mortuary ceremonialism, trade networks, and political systems. Woodland Stage sites have been found throughout the central and northern New York region, and several Late Woodland sites have been identified along the Black River in Lewis and Jefferson Counties.

Before the European incursion, the Adirondack region was controlled by the Oneida and Mohawk. The earliest direct European contact in the region took place in the mid-seventeenth century when the French explorer Simon LeMoyne made contact with the Onondaga at what is now Syracuse. The first European settlement in the region was the Castorland Colony, a French settlement dating to the late 18th century. The Castorland settlement was an attempt to create a community along the Black River, but the local representatives and founders of the colony were misled as to the nature of the territory and the accessibility of the Black River. By 1793, the Castorland Colony was established immediately downriver from Lyons Falls, on a bluff overlooking the east bank of the Black River. The community attracted very few residents and was populated for much of its existence by company employees who used the site as a base for exploring and mapping the Black River. The few French families that did arrive rarely stayed long, as conditions were nearly unbearable.

Despite this early level of activity, the community never received the kind of support that it needed for long-term survival. According to Pilcher (1985:128), "Although the [Castorland] Company officially remained in existence until 1814, when its charter expired, there was never a sufficient infusion of people and resources at one time to produce a viable settlement. In all, only about 20 French families resided there at one time or another." At the same time, however, other, more well-financed settlements came into being in the region, including what is now Boonville and Barneveld. Toward the middle of the century, American settlers began to propose a town at the abandoned Castorland settlement, what was then called the "High Falls," including Caleb Lyons. While Lyons owned the water rights of the falls that now bear his name, he never settled there. The most important incentive to settlement came in the mid-nineteenth century with the completion of the Black River Canal. Completed in 1856, the Black River Canal allowed boats to travel from High Falls to Rome, where it connected to the Erie Canal. The canal required 109 locks over its 35-mile length and opened the region to manufacturing development, which focused on sawmills and tanneries. Lumbering and the manufacturing of

timber products such as pulp were vital parts of the region's economy. The region's limited manufacturing continued despite the abandonment of the canal in the early twentieth century.

The Village of Lyons Falls became an important center for the timber pulp industry in 1892, when Henry P. Gould founded the Gould Paper Company. Gould's pulp and paper mill was completed in early 1896 at the location of an earlier saw mill, with a sulphite mill added in 1900. The initial plans, filed in 1893, noted that Gould intended to build a dam and use the water power for his mill. The mill initially used an existing timber crib dam; this dam was replaced in 1922 by the current concrete dam. The hydroelectric facilities were added to the mill complex over the course of the next few decades.

Previous Studies

In 1983, Pratt and Pratt conducted a cultural resources survey of areas that were proposed for redevelopment by the former licensee, Georgia-Pacific. The proposed redevelopment at that time included repairs and replacement of electrical generation equipment at all three developments that comprise the Project (Pratt and Pratt 1983). The Pratt and Pratt survey area extended primarily along the Moose River from Lyonsdale west to Lyons Falls. Their study consisted of a background and literature search followed by an archaeological field survey. For the field survey, they conducted shovel tests along transects that lined both sides of the Moose River.

This survey resulted in the recovery of several historic-period artifacts along all three transects. However, they found no evidence of precontact or of early French occupation. Pratt and Pratt concluded that the actions that were then proposed (including the construction of a new powerhouse at Lyons Falls Mill) would "not be expected to impact any settlement related to Indian or French occupation" (Pratt and Pratt 1983). While they concluded that the then-proposed actions had the potential to affect the historic mills along the Moose River, they noted no impacts to Lyons Falls Mill. Further, while they noted that the hydroelectric installations at the mills were "of interest as part of the fabric of the use of water power sites," they concluded that the hydroelectric installations themselves would not be eligible for the National Register of Historic Places (NRHP) (Pratt and Pratt 1983).

In addition, in support of the demolition of the former paper mill, the New York State Office of Parks, Recreation and Historic Preservation's (OPRHP) was consulted with regarding the proposed demolition activities. As a result of this consultation, the ORPHP indicated in a June 14, 2013 letter that demolition of the former paper mill "will have No Impact" upon cultural resources in or eligible for inclusion in the State and National Register of Historic Places." This is applicable to NBLF's proposed redevelopment plan for the hydropower facility given the associated activities will occur within the footprint of the former paper mill.

Studies Conducted by NBLF

In 2007, the Public Archaeology Facility of the State University of New York at Binghamton (PAF) conducted a Phase IA Cultural Resources Assessment of the upgrades to Lyons Falls proposed in 2006, including construction of a new powerhouse on river right. The Area of Potential Effects (APE) for the upgrades proposed in 2006 was located along the east bank of the Black River from the bluff adjacent to the falls, to the boat launch approximately 400 feet downstream of the falls, and from the edge of the river inland to the public access road. The study consisted of a pedestrian walkover combined with auger probes. The pedestrian walkover identified those portions of the APE that had the potential for intact soils. Two distinct soil deposition locales were identified, running roughly parallel to the Black River. A band that ranged from 45 to 50 meters in width lying closest to the river was identified as completely scoured, containing only high-energy alluvium, with no potential to contain intact archaeological resources. However, the pedestrian walkover identified a terrace of intact soils lying between the band of high-energy alluvium and the public access road, varying from 12 to 15 meters in width, featuring a thin cap of late Holocene alluvium over terminal Pleistocene silts. This band of soils, extending approximately 110 meters from the base of the bluff adjacent to the falls to the boat launch downriver, was determined by PAF to have the potential to contain archaeological deposits. Since the 2006 upgrades were expected to impact intact soils, PAF recommended that a Phase IB Field Investigation be conducted on the narrow band of soil with the potential to contain significant archaeological resources. As noted above, NBLF decided not to pursue the proposed upgrades in 2007; therefore, additional testing was not conducted along the east shoreline of the Black River.

In January 2015, NBLF conducted a review of the OPRHP Cultural Resources Information System (CRIS) to identify reported archaeological and historic resources within a one-mile radius of Lyons Falls Mill, including resources previously listed in or determined eligible for the NRHP. Table E.2-12 presents archaeological and historic resources identified through a review of the CRIS database.

TABLE E.2-12 PREVIOUSLY REPORTED ARCHAEOLOGICAL AND HISTORIC RESOURCES WITHIN ONE MILE OF LYONS FALLS MILL

Name	Туре	Affiliation	NRHP Status
Castorland Colony	Archaeological Site	Historic	Undetermined
The Pines	Building	Historic	Listed
Lyons Falls Pulp and Paper Mill	Buildings and	Historic	Undetermined
Complex	archaeological site		
Gould Mansion Complex	Building	Historic	Listed
Clark House	Building	Historic	Undetermined
Brian Belmont House	Building	Historic	Undetermined
Forest Presbyterian Church and Manse	Buildings	Historic	Listed
Mid 19 c gable roof frame dwelling 3	Building	Historic	Undetermined
bay, Italianate detailing; some			
alterations			
Harris House (Hotel)/Hendel's Hotel	Building	Historic	Eligible
IGTS 081-AF1-1	Archaeological site	Historic	Undetermined
Wildwood Cemetery & Mary Lyon	Historic Site	Historic	Listed
Fisher memorial Chapel			

Of the resources identified in Table E.2-12, only the Lyons Falls Pulp and Paper Mill Complex is located within or adjacent to Lyons Falls Mill. There is little existing information regarding this resource, and it is unclear whether the Lyons Falls Pulp and Paper Mill Complex includes the existing facilities that comprise Lyons Falls Mill. In any case, the NRHP-eligibility of this property has not been determined.

By letter dated January 29, 2015, NBLF initiated informal consultation with the New York State Historic Preservation Officer (SHPO) to determine if historic properties listed in or eligible for inclusion in the NRHP will be effected by the proposed redevelopment of Lyons Falls Mill. Copies of this consultation correspondence have been included in Appendix D to this Initial Consultation/Amendment Package.

Existing and Proposed PM&E Measures

Article 409 of the existing license requires the licensee to consult with the SHPO prior to any change in location of any construction activities and prior to any future construction at the Project. If any previously unrecorded archeological or historic sites are discovered during the construction or development of any Project works or associated facilities, construction activity in the vicinity shall be halted, a qualified archeologist shall be consulted to determine the significance of the sites, and the licensee shall consult with the SHPO to develop a mitigation plan for the protection of significant archaeological or historic resources. It the licensee and the SHPO cannot agree on the amount of money to be expended on archeological or historical work related to the Project, the Commission reserves the right to require the licensee, at its own expense, to conduct any necessary work.

NBLF proposes to continue consultation activities with the SHPO to determine if the Lyons Falls Pulp and Paper Mill Complex or any other historic resources will be adversely affected by the proposed redevelopment. If necessary, NBLF will develop an avoidance, protection, and/or mitigation plan for FERC and SHPO approval following FERC's order amending the license and prior to the start of construction activities.

Continued or Incremental Impacts on Cultural or Historic Resources

NBLF is not aware of any ongoing impacts on cultural or historic resources related to operation of Lyons Falls Mill and the proposed redevelopment. As discussed above, NBLF will continue to consult with the SHPO to determine if proposed redevelopment of Lyons Falls Mill will have any adverse effects on historic properties. If necessary, NBLF will develop an avoidance, protection, and/or mitigation plan for FERC and SHPO approval following FERC's order amending the license and prior to the start of construction activities.

E.2.9 Report on Land Management and Aesthetics

The area surrounding Lyons Falls Mill is mostly rural, heavily forested, and relatively undeveloped. The eastern portion of the Black River Basin is characterized by limestone plateaus, steep rugged mountains, and an extensive system of lakes. To the west, the Tug Hill Plateau is characterized by sand terraces and deep gorges cut by tributary streams flowing eastward from the plateau to the Black River. The northern end of the basin in the vicinity of Lake Ontario is characterized by rolling hills with a gradual downward slope toward Lake Ontario. The Black River Valley floor is at an elevation of approximately 750 feet msl. Elevation in the Ontario Lowlands is about 250 feet msl (FERC 1995).

Lyons Falls Mill is located entirely within Lewis County. From the tailrace of Lyons Falls Mill, the Project boundary generally follows the shorelines of the Black and Moose Rivers upstream approximately 2.5 and 1.3 miles respectively. The Project boundary encompasses lands on the eastern shore of the tailwater, totaling approximately 13 acres, including the project works. The east side of the Lyons Falls Dam along river right is within the jurisdictional boundaries of the Town of Lyonsdale with the majority of the Development under the jurisdiction of the Town of West Turin.

Description of Existing Development and Use of Project Lands

The Black River Basin, one of New York State's smallest, includes both the Black and Moose Rivers and supports a diverse set of land use practices. The eastern portions of the basin consist of densely forested woodlands associated with the Adirondack Mountains. Land use and management in this portion of the basin consists mainly of silviculture, recreation, and tourism.

Lyons Falls Mill lies entirely within Lewis County, New York, which is approximately 1,272 square miles in area. Lewis County is dominated by second growth northern hardwoods, which comprise approximately 55 percent of the land cover, followed by agricultural lands at approximately 19 percent, and residential lands at 14 percent (Table E.2-13). The remaining lands within Lewis County are comprised of commercial, industrial, public, and recreational lands among other uses (Lewis County 2006).

LEWIS COUNTY LAND USE					
Type of Use	Square Miles	Acres	Percent of County		
			Land		
Agricultural	244.07	156,205.9	19.2		
Residential	177.97	113,900.1	14.0		
Vacant (Open Space)	92.79	59,390.8	7.3		
Commercial	2.54	1,627.5	0.2		
Recreation/Entertainment	3.81	2,440.7	0.3		
Community Services	36.86	23,593.0	2.9		
Industrial	2.54	1,627.5	0.2		
Public	15.25	9,762.8	1.2		
Wild/Forested	695.35	445,024.1	54.7		
Total	1,271.18	813,572.4	100.0		

TABLE E.2-13 LEWIS COUNTY LAND USE

Almost 20 percent of the lands of Lewis County are agricultural lands, producing goods such as corn, oat, and dairy (National Agriculture Statistics Service, 2001 and Lewis County, 2006). In 2007, there were 616 farms on over 167,000 farmland acres within Agricultural District 6 of Lewis County (Lewis County 2009).

There are no prime or unique farmlands, as designated by the Natural Resources Conservation Service (NRCS) of the US Department of Agriculture, the Special Area Management Plan of the Office of Coastal Zone Management, or the National Oceanic and Atmospheric Administration (NOAA) within the immediate vicinity of Lyons Falls Mill.

The Village of Lyons Falls is one of the smaller population centers in the Black River Valley between the Adirondack Mountains and the Tug Hill Plateau (NYSDEC 2007). The U.S. Census Bureau reports that the Village of Lyons Falls has a population of approximately 566 (US Census Bureau 2010). The Town of West Turin, the Town of Lyonsdale, and Lewis County have populations of approximately 1,524; 1,227; and 27,087, respectively (US Census Bureau 2010).

Land Management

Land use on privately owned lands within Lewis County is regulated by the Lewis County Planning Department. Lewis County developed a Comprehensive Plan for the County to guide land use planning and community development for 10-15 years following 2009⁹.

The County has a Comprehensive Economic Development Strategy (2006) that provides information on topics related to agriculture, land use patterns, housing and transportation, recreation, and infrastructure. The purpose of the plan is to set forth development strategies for the county to, among other things:

- Protect, support, and promote our current economic base to retain existing employment opportunities and increase availability of good quality employment opportunities through attraction of new business;
- Create a positive environment for growth in the economy and community;
- Promote Lewis County as a great place to visit;
- Maximize utilization of existing resources to enhance the multiplier effect and valueadded opportunities within the County.

Existing Zoning Regulations

The Village of Lyons Falls is not subject to the zoning regulations of Lewis County, nor is the village within the jurisdiction of the Lewis County Rural Development Plan or Land Use Plan (Lewis County Planning Department 2006). Lyons Falls Mill lies mostly within the jurisdiction of the Village of Lyons Falls and Town of West Turin. The eastern border of the Development is adjacent to the Town of Lyonsdale.

Management of Project Lands

Project operations and associated maintenance are the primary activities that occur at Lyons Falls Mill. This includes operating and maintaining the powerhouses and associated facilities (FERC 1986). Public recreation facilities at the Project are discussed in Section E.2.7, above.

⁹ Personal communication, Renee Byer, Lewis County, October 2, 2007.
Aesthetic Resources

The landscape surrounding Lyons Falls Mill includes moderate hills and forested terrain with relatively shallow streambeds. Northern hardwood forest species including sugar maple, beech, yellow birch, and conifers such as white pine and hemlock dominate the vegetation (FERC 1986).

The Moose River and Black River comprise the most significant aesthetic resources associated with Lyons Falls Mill. The Black River drops approximately 60 feet at Lyons Falls and is the highlight of aesthetic and visual resources at the site. Although views of the falls are somewhat limited because of dense vegetation and the low hilly relief of the area, the falls can be viewed from numerous locations downstream, including from the canoe access located downstream of the falls. Both the Black and Moose Rivers are considered valuable scenic resources to boaters and the local community (FERC 1986).

Project works, the impoundment, Lyons Falls, and the tailrace are visible from several vantage points around Lyons Falls Mill. On the Moose River, the impoundment and Project works are visible from the Lyons Falls Road Bridge, which crosses the Moose River approximately 750 feet upstream of the Lyons Falls Dam (Photo Plate E.2-7). On the Black River, the impoundment, top of the dam, and Project works can be seen from the Laura Street Bridge, which traverses the Black River approximately 1,050 feet upstream of the dam (Photo Plate E.2-8). The impoundment and dam can also be seen from the gravel boat launch, adjacent to the Lyons Falls Road Bridge, and from a dead-end road that terminates at the confluence of the Moose and Black Rivers (Photo Plate E.2-9). The tailrace, dam, Project works, and Lyons Falls can be seen from several vantage points downstream including the canoe access site on the eastern shore of the Black River, downstream of Lyons Falls Mill (Photo Plate E.2-10).



Photo Plate E.2-7 Lyons Falls impoundment looking downstream at Lyons Falls Mill.



Photo Plate E.2-8. Black River and Laura Street Bridge from the impoundment looking upstream.



Photo Plate E.2-9. Confluence of Moose and Black River at the Lyons Falls impoundment looking upstream into Moose River.



Photo Plate E.2-10. Lyons Falls and existing project works, view from downstream canoe access and shoreline angling site.

Existing and Proposed PM&E Measures

Article 406 of the existing license for the Project requires that the licensee develop a plan to avoid or minimize disturbance to the existing visual resources caused by the construction and maintenance of Project works and that Project works blend into the existing landscape through use of natural materials, landscape vegetation, and debris removal.

NBLF proposes to develop an Aesthetic Resources Plan to avoid or minimize disturbance of existing visual resources associated with the proposed upgrade. The plan will describe how the design of the new powerhouse and other facilities associated with the proposed upgrade will blend with the surrounding environment through the use of similar colors and materials. The proposed Aesthetic Resources Plan will also provide standard BMPs to address landscape vegetation, site stabilization, and debris removal associated with the proposed upgrade. NBLF proposes to develop the Aesthetic Resources Plan following the Commission's issuance of an order approving the proposed amendment and in consultation with the Town of Lyons Falls, NYSDEC, USFWS, Lewis County, and other parties. NBLF will submit the plan for FERC approval prior to the start of construction.

There are currently no minimum flow requirements at Lyons Falls Mill, and aesthetic flows over Lyons Falls only occur when the hydraulic capacity of the existing units is exceeded. NBLF proposes to provide a seasonal minimum aesthetic flow of 25 cfs over Lyons Falls for the duration of the recreational season (May 1 – October 31). The seasonal minimum aesthetic flow will enhance the aesthetics of the falls during the recreation season. NBLF will consult with the Town of Lyons Falls, NYSDEC, USFWS, Lewis County, and other parties to determine the appropriate location and mechanism for the seasonal minimum aesthetic flow release.

Continued or Incremental Impacts on Land Management and Aesthetic Resources

NBLF manages the lands and recreation areas within the FERC Project boundary in accordance with the existing license. NBLF proposes to develop an Aesthetic Resources Plan avoid or minimize disturbance of existing visual resources associated with the proposed upgrade. Further, NBLF proposes to provide a seasonal minimum aesthetic flow of 25 cfs over Lyons Falls for the duration of the recreational season. NBLF expects that these PM&E measures will enhance and protect land management and aesthetic resources at Lyons Falls Mill. Therefore, NBLF does not anticipate any continued or incremental impacts on land management or aesthetic resources as a result of the proposed redevelopment.

E.2.10 Relevant Comprehensive Plans

NBLF has reviewed the federal and New York State list of comprehensive plans adopted by the Commission under Section 10(a)(2)(A) of the Federal Power Act, 16 U.S.C. § 803 (a)(2)(A). Of the 41 reviewed comprehensive plans, 5 were deemed to be applicable to the Project. These five plans consist of the following:

- Interstate Fishery Management Plan for American Eel (*Anguilla rostrata*) (Atlantic State Marine Fisheries Commission Service [ASMFC] 2000.
- The Nationwide Rivers Inventory.
- North American Waterfowl Management Plan (North American Waterfowl Management Plan, Plan Committee 2004).
- Fisheries USA: The Recreational Fisheries Policy of the U.S. Fisheries and Wildlife Service (USFWS) (1989).
- New York State Statewide Comprehensive Outdoor Recreation Plan (SCORP) (NYSOPRHP 2010).

Based on a review of these five comprehensive plans, current and proposed operations of Lyons Falls Mill have been determined to be consistent with these plans.

Exhibit F - General Design Drawings

NBLF is preparing general design drawings in coordination with the engineering design process and stakeholder consultation. NBLF will continue to develop these drawings and will present the information required for Exhibit F – General Design Drawings in the final application.

Exhibit G - Project Boundary

NBLF is reviewing the Project boundary map in coordination with the design process and stakeholder consultation. NBLF will present the information required for Exhibit G – Project Boundary in the final application.

APPENDICES

APPENDIX A

LYONS FALLS MILL FLOW DURATION CURVES



























APPENDIX B

IMPOUNDMENT SEDIMENT CHARACTERIZATION AND DEPTH

APPENDIX B IMPOUNDMENT SEDIMENT CHARACTERIZATION AND DEPTH

In support of the upgrades proposed in 2006, NBLF conducted an evaluation to characterize accumulated sediment within the Lyons Falls Mill impoundment. NBLF evaluated the depth and composition of sediment with the use of a sediment probe and an underwater camera. NBLF established three longitudinal transects in the impoundment with a total of 18 sampling points, spaced at approximately 50 foot intervals (Figure B-1). Four sediment depth probes were made at each site for a total of 72 measurements. At each station, a sediment probe was firmly sunk though the loose sediment layers until solid contact with bedrock or hardpan was made. During each probe, an underwater camera was lowered to the impoundment during the survey was approximately 8 feet. In addition, an assessment of the physical dimensions of a small sediment wedge (directly behind dam) was conducted.

The results of the survey indicate that there is relatively little accumulated fine-grained sediment in the impoundment (Figure B-2). That which does exist is dominated by sand. The bulk of this material is located on river right, opposite of the existing powerhouses and the proposed location for redevelopment. In general, the impoundment is dominated by larger sized substrates (gravels and cobbles) that are not heavily embedded with fines. Average sediment depth in the impoundment is less than 0.5 foot (Table B-1). A small sediment wedge consisting primarily of gravels and sand exists along a portion of the upstream face of the dam. The approximate dimensions of the sediment wedge are 6 feet (width) by 3 feet (depth) by 100 feet (length along dam face). The proposed redevelopment of the site currently under consideration is not expected to cause mobilization of this sediment wedge, as no modifications to the dam are proposed.

The depth and composition of the existing substrates indicate that fine-grained sediment (silts) likely move through the turbines, surface sluice gates, or over the dam when water spills during high flows.

FIGURE B-1 LOCATION OF SUBSTRATE/SEDIMENT SAMPLE STATIONS IN THE LYONS FALLS IMPOUNDMENT





FIGURE B-2 PERCENT DOMINANT SUBSTRATE IN THE LYONS FALLS IMPOUNDMENT, LYONS FALLS, NEW YORK, NOVEMBER 2006

TABLE B-1

DOMINANT SUBSTRATE TYPE AND AVERAGE SEDIMENT DEPTH AT 18 IMPOUNDMENT SAMPLING STATIONS, LYONS FALLS MILL, LYONS FALLS, NEW YORK, NOVEMBER 2006

Sample Location	Mean Sediment Depth (feet)	Dominant Substrate
А	0.00	Cobble/Sand
В	1.15	Sand
С	0.88	Sand
D	1.15	Sand
Е	0.76	Sand/Small Gravel
F	0.00	Gravel
G	0.00	Cobble
Н	0.00	Cobble
Ι	0.00	Cobble
J	0.00	Boulder
K	0.00	Bedrock
L	0.00	Bedrock
М	0.00	Boulder
N	2.09	Sand
0	0.63	Mixed
Р	0.21	Sand
Q	0.00	Bedrock
R	0.00	Boulder
Average Depth of Sediment:	0.38 feet	Sand

APPENDIX C MACROINVERTEBRATE DATA

TABLE C-1 MACROINVERTEBRATE TAXA

Class	Order	Family	BMI TR1	BMI TR2	BMI TR3	BMI TR4	BMI TR5	BMI TR6	BMI BR1	BMI BR2	BMI MR1	
Hirudinea						3				4	6	
Nematomorpha												
Oligochaeta			1			9	6		2	16	31	
Arachnida	Hydracarina		1				1		3			
Copepoda						1					4	
	Amphinoda	Gammaridae	1									
	Апрпроии	Hvalellidae	1			2	2		29		1	
	Isonoda	Asellidae	1	1		2	<u> </u>		7		1	
	1500000	/ Semaae	-	-		L			,			
Gastropoda		Hydrobiidae								1	1	
		Lymnaecidae	1									
		Planorbidae	1			1					1	
		Physidae										
		Viviparidae										
Diveluie		Cabooniidoo	1			2				4	2	
BIVAIVIA	Unionacoa	Sphaemuae	T			Z				4	Ζ	
	Unionacea									T		
Insecta												
	Ephemeroptera	Baetiscidae			2		1		4			
		Caenidae										
		Ephemerellidae		2				2				
		Heptagenidae						18			1	
		Isonychiidae						8				
		Leptophlebiidae		8	26	7	9	8	4		4	
		Polymitarcyidae										
		Siphlonuridae			5		15					
		Tricorythidae	1	41	5		6		1	1	22	
	Odonata	Aeshinidae						2				
		Coenagrionidare	1				3		10	2		
		Cordulegastridae								2		
		Gomphidae	1	1							1	
	Discontoro	Canniidaa	69	20	22	63	6	Γ4				
	Piecoptera	Caphildae	80	38	22	62	0	54				
		Chloroperildae	2			2						
		Perlidae						2				
	Hemiptera	Belostomatidae								1		
		Corixidae			10		1		1	1		
		Gyrinidae			1							

BMI MR2	BMI IMP1	BMI IMP2
	3	2
1		
35	38	12
		2
	3	
	1	
		1
		7
		1
		1
		1
	1	
	13	5
6	2	1
1	1	
	3	

Class	Order	Family	BMI TR1	BMI TR2	BMI TR3	BMI TR4	BMI TR5	BMI TR6	BMI BR1	BMI BR2	BMI MR1	BMI MR2	BMI IMP1	BMI IMP2
		Notonectidae			1									
	Megaloptera	Sialidae									1			
	Trichoptera	Hydropsychidae	1				1		2					
		Lepedostomatidae	1				4							
		Leptoceridae	1											
		Limnephilidae		6	22	2								10
		Philopotamidae								1				
		Phryganeidae					1	2	1		4		7	
		Polycentropodidae							4			4		
		Psychomyiidae	6											
		Rhyacophilidae						2					1	
	Coleoptera	Elmidae	3				1	2	3	10				1
		Haliplidae	1											
	Diptera	Ceratopogonidae				2	6			4	4	3	5	6
		Chironomidae	4	3	6	4	37		29	52	20	54	21	50
		Psychodidae	1											
		Sciomyzidae	1											
		Simuliidae	1											
		Tipulidae		1	1	1				1	1			
	Lepidoptera												1	
			101	101	101	100	100	100	100	101	104	104	100	100

APPENDIX D

CONSULTATION CORRESPONDENCE



United States Department of the Interior

FISH AND WILDLIFE SERVICE New York Ecological Services Field Office 3817 LUKER ROAD CORTLAND, NY 13045 PHONE: (607)753-9334 FAX: (607)753-9699 URL: www.fws.gov/northeast/nyfo/es/section7.htm



Consultation Code: 05E1NY00-2015-SLI-0342 Event Code: 05E1NY00-2015-E-01036 Project Name: Lyons Falls Mill Redevelopment January 17, 2015

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). This list can also be used to determine whether listed species may be present for projects without federal agency involvement. New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list.

Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list. If listed, proposed, or candidate species were identified as potentially occurring in the project area, coordination with our office is encouraged. Information on the steps involved with assessing potential impacts from projects can be found at: http://www.fws.gov/northeast/nyfo/es/section7.htm

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (

http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the Services wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and

http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the ESA. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment



Project name: Lyons Falls Mill Redevelopment

Official Species List

Provided by:

New York Ecological Services Field Office 3817 LUKER ROAD CORTLAND, NY 13045 (607) 753-9334_ http://www.fws.gov/northeast/nyfo/es/section7.htm

Consultation Code: 05E1NY00-2015-SLI-0342 **Event Code:** 05E1NY00-2015-E-01036

Project Type: Dam

Project Name: Lyons Falls Mill Redevelopment **Project Description:** Redevelopment of existing hydropower powerhouse.

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.



Project name: Lyons Falls Mill Redevelopment

Project Location Map:



Project Coordinates: MULTIPOLYGON (((-75.360907 43.6277757, -75.3608989 43.6277756, -75.3608915 43.6277723, -75.3495647 43.6195107, -75.3332602 43.6147892, -75.3332542 43.6147863, -75.3332494 43.6147815, -75.3332466 43.6147755, -75.3318733 43.6099283, -75.3318728 43.6099196, -75.331876 43.6099115, -75.3318823 43.6099056, -75.3318906 43.6099029, -75.3382421 43.6092815, -75.3382506 43.6092825, -75.3530923 43.614438, -75.3573455 43.6127752, -75.3491317 43.6058985, -75.3491269 43.6058927, -75.3491246 43.6058856, -75.3491252 43.6058781, -75.3491284 43.6058713, -75.3491339 43.6058662, -75.3491409 43.6058635, -75.3570373 43.604434, -75.3570454 43.6044342, -75.3570527 43.6044376, -75.3570581 43.6044435, -75.3622938 43.6133306, -75.3622962 43.6133368, -75.3622964 43.6133434, -75.3622945 43.6133496, -75.3601537 43.6176895, -75.3657268 43.6266272, -75.3657295 43.6266345, -75.3657293 43.6266423, -75.3657261 43.6266494, -75.3657204 43.6266548, -75.3657131 43.6266575, -75.3657053 43.6266573, -75.3656982 43.6266541, -75.3656928 43.6266484, -75.3601138 43.6177012, -75.3601113 43.6176949, -75.3601109 43.6176882, -75.3601129 43.6176818, -75.3622539 43.6133416, -75.3570307



Project name: Lyons Falls Mill Redevelopment

43.6044759, -75.3491901 43.6058953, -75.357397 43.6127662, -75.3574021 43.6127726, -75.3574042 43.6127806, -75.3574029 43.6127887, -75.3573984 43.6127956, -75.3573915 43.6128001, -75.3531 43.6144779, -75.3530931 43.6144793, -75.3530861 43.6144782, -75.3382416 43.6093217, -75.3319183 43.6099404, -75.333282 43.6147539, -75.3495792 43.6194733, -75.3495854 43.6194763, -75.3609081 43.6277348, -75.3657919 43.6268045, -75.3657997 43.6268045, -75.3658068 43.6268076, -75.3658123 43.6268131, -75.3658152 43.6268204, -75.3658152 43.6268282, -75.3658121 43.6268353, -75.3658066 43.6268408, -75.3657993 43.6268437, -75.360907 43.6277757)))

Project Counties: Lewis, NY



Project name: Lyons Falls Mill Redevelopment

Endangered Species Act Species List

There are a total of 2 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Mammals	Status	Has Critical Habitat	Condition(s)
Indiana bat (<i>Myotis sodalis</i>) Population: Entire	Endangered		
northern long-eared Bat (Myotis septentrionalis)	Proposed Endangered		


United States Department of Interior Fish and Wildlife Service

Project name: Lyons Falls Mill Redevelopment

Critical habitats that lie within your project area

There are no critical habitats within your project area.

http://ecos.fws.gov/ipac, 01/17/2015 06:45 AM

FR

January 23, 2015

Mr. Matthew Maraglio Coastal Review Specialist New York Department of State One Commerce Plaza 99 Washington Avenue Albany, NY 12231-0001

Subject: Lyons Falls Project (FERC No. 2548) Lyons Falls Mill Redevelopment Coastal Zone Consistency Determination

Mr. Maraglio:

Northbrook Lyons Falls, LLC (NBLF), an affiliate of Kruger Energy, Inc., is the licensee for the Lyons Falls Project (FERC No. 2548) (Project), located along the Moose and Black rivers in Lewis County, New York. The Project operates under a license issued by the Federal Energy Regulatory Commission (FERC) on May 6, 1986 and which expires on May 31, 2026. NBLF is proposing to redevelop the Project's Lyons Falls Mill Development (Lyons Falls Mill) to increase the efficiency and overall energy output of the hydroelectric facility. On behalf of NBLF, HDR is gathering information in support of a proposed capacity related amendment to the Project's existing FERC license to authorize redevelopment of Lyons Falls Mill.

Consistent with this effort, HDR is requesting a determination from your office regarding the applicability of the State's Coastal Zone Policies to Lyons Falls Mills. Based on a review of applicable information, we do not believe that the project is located within the State's Coastal Zone and are requesting confirmation of this determination from your office. In support of this confirmation, we have included a map indicating the location of this facility.

We respectfully request a response to this request within 30 days of the date of this letter. If you have any questions or need additional information regarding this project or its location, please feel free to contact me at (315) 414-2202 or jim.gibson@hdrinc.com.

Thank you for your assistance with this request.

Jim Gibson Project Manager

Attachment

cc: Dan Parker (NBLF)

hdrinc.com

1304 Buckley Road, Suite 202, Syracuse, NY 13212-4311 (315) 451-2325



FX

January 23, 2015

New York Natural Heritage Program – Information Services New York Sate Department of Environmental Conservation Attn: Jean Pietrusiak 625 Broadway, 5th Floor Albany, NY 12233-4757

Subject: Lyons Falls Project (FERC No. 2548) Lyons Falls Mill Redevelopment Request for Threatened and Endangered Species Information

Ms. Pietrusiak:

Northbrook Lyons Falls, LLC (NBLF), an affiliate of Kruger Energy, Inc., is the licensee for the Lyons Falls Project (FERC No. 2548) (Project), located along the Moose and Black rivers in Lewis County, New York. The Project operates under a license issued by the Federal Energy Regulatory Commission (FERC) on May 6, 1986 and which expires on May 31, 2026. NBLF is proposing to redevelop the Project's Lyons Falls Mill Development (Lyons Falls Mill) to increase the efficiency and overall energy output of the hydroelectric facility. On behalf of NBLF, HDR is gathering information in support of a proposed capacity related amendment to the Project's existing FERC license to authorize redevelopment of Lyons Falls Mill. In support of this process, HDR is requesting information regarding the following within the project area:

- State-listed threatened or endangered species;
- Species proposed for listing as threatened or endangered, or species of concern;
- Designated and proposed critical habitat; and
- Candidate species.

The attached map shows the area for which the information is being requested and the general location of the area relative to the facility.

NBLF is currently gathering information in support of the amendment application and respectfully requests a response within 30 days of the date of this letter. If you have any questions or need additional information regarding Lyons Falls Mill or its location, please feel free to contact me at (315) 414-2202 or jim.gibson@hdrinc.com.

Thank you for your assistance with this request.

Jim Gibson Project Manager

Attachment

cc: D. Parker (NBLF)

hdrinc.com

1304 Buckley Road, Suite 202, Syracuse, NY 13212-4311 (315) 451-2325



January 29, 2015

Ruth Pierpont New York State Division for Historic Preservation New York State Office of Parks, Recreation & Historic Preservation Peebles Island State Park P.O. Box 189 Waterford, NY 12188-0189

Subject: Lyons Falls Project (FERC No. 2548) Lyons Falls Mill Redevelopment Request for Historical and Cultural Resources Information

Ms. Pierpont:

Northbrook Lyons Falls, LLC (NBLF), an affiliate of Kruger Energy, Inc., is the licensee for the Lyons Falls Project (FERC No. 2548) (Project), a hydroelectric generating facility located along the Moose and Black rivers in Lewis County, New York (see attached map). The Project operates under a license issued by the Federal Energy Regulatory Commission (FERC) on May 6, 1986 and which expires on May 31, 2026. NBLF is proposing to redevelop the Project's Lyons Falls Mill development (Lyons Falls Mill) to increase the efficiency and overall energy output of the hydroelectric facility. On behalf of NBLF, HDR is gathering information in support of a proposed amendment to the Project's existing FERC license to authorize redevelopment of Lyons Falls Mill.

Redevelopment of the Lyons Falls Mill facility will take place entirely within the footprint of the former Lyons Falls Paper Mill located along river left (looking downstream). The Lyons Falls Paper Mill is currently undergoing demolition, and your office has previously determined that demolition of the paper mill would have No Impact on cultural resources listed in or eligible for inclusion in the State or National Register of Historic Places (please see attached correspondence). The existing hydroelectric facility formerly provided power to the mill.

The ongoing demolition of the paper mill structures will allow for all redevelopment activities to occur within the footprint of the former paper mill site. Upon approval of the redevelopment, the existing primary hydroelectric powerhouse at Lyons Falls Mill will be demolished and a single-unit powerhouse will be mothballed. A new powerhouse would be constructed to house two new generating units.

As noted above, the New York State Historic Preservation Officer has previously indicated that demolition of the Lyons Falls Paper Mill will have no impacts on properties listed in or eligible for the State or National Registers. Because the Lyons Falls Mill hydroelectric development is within the footprint of the paper mill (and was originally constructed to provide power to the mill), NBLF anticipates that the proposed redevelopment of the hydroelectric facilities at the site will similarly not have any adverse effect on historic properties.

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On behalf of NBLF, HDR is requesting information from your office regarding the proposed redevelopment and to identify any known historical or cultural resources that may affected. We respectfully request a response to this request within 30 days of the date of this letter. If you have any questions or need additional information regarding this project or its location, please feel free to contact me at (315) 414-2202 or jim.gibson@hdrinc.com.

Thank you for your assistance with this request.

Jim Gibson Project Manager

Attachments (2)

cc: Dan Parker (NBLF) Rob Quiggle (HDR)





New York State Office of Parks, Recreation and Historic Preservation

Division for Historic Preservation P.O. Box 189, Waterford, New York 12188-0189 518-237-8643

June 14, 2013

Steven Eckler O'Brien & Gere 333 W. Washington Street Syracuse, New York 13221

Re: ESDC

Demolition of Former Lyons Falls Paper Mill, Center Street LYONS FALLS, Lewis County 13PR02686

Dear Mr. Eckler:

Thank you for requesting the comments of the Office of Parks, Recreation and Historic Preservation (OPRHP). We have reviewed the project in accordance with the New York State Historic Preservation Act of 1980 (Section 14.09 of the New York Parks, Recreation and Historic Preservation Law). These comments are those of the Division for Historic Preservation and relate only to Historic/Cultural resources. They do not include potential environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8) and its implementing regulations (6 NYCRR Part 617).

Based upon this review, it is the OPRHP's opinion that your project will have No Impact upon cultural resources in or eligible for inclusion in the State and National Register of Historic Places.

If further correspondence is required regarding this project, please be sure to refer to the OPRHP Project Review (PR) number noted above.

Sincerely,

Ruth &. Rupont

Ruth L. Pierpont Deputy Commissioner for Historic Preservation

Andrew M. Cuomo Governor

> Rose Harvey Commissioner